TABLE OF CONTENTS

## CHAPTER V. TRANSPORTATION OF EXPLOSIVES

## CHAPTER VI. USE OF EXPLOSIVES AND BLASTING AGENTS

## CHAPTER VII. EXPLOSIVES AT PIERS, RAILWAY STATIONS AND CARS OR VESSELS NOT OTHERWISE SPECIFIED IN THESE REGULATIONS



## CHAPTER VIII. BLASTING AGENTS

## CHAPTER IX. STORAGE OF AMMONIUM NITRATE

## CHAPTER X. PROTECTION OF STORED EXPLOSIVES



## CHAPTER XI. WATER GELS OR SLURRY EXPLOSIVES

CHAPTER XII. SMALL ARMS AMMUNITION, SMALL ARMS PRIMERS AND SMOKELESS PROPELLANTS



CHAPTER XIII. FORBIDDEN EXPLOSIVES

# Transportation, Storage and Use of Explosives

Secs. 29-349-1 to 29-349-105.
Repealed, April 18, 1972.

# Storage, Transportation and Use of Explosives and Blasting Agents

## CHAPTER I. DEFINITIONS

### Sec. 29-349-106. Terms and definitions

When used in these regulations the following terms and definitions shall prevail:

"Approved" shall mean approved by the state fire marshal.

"Artificial barricade" shall mean an artificial mound or revetted wall of earth of a minimum thickness of three feet.

"Barricade" shall mean a natural or artificial barricade.

"Barricaded" shall mean that a building containing explosive is effectually screened from a magazine, building, railway or highway, either by a natural barricade or by an artificial barricade of such height that a straight line from the top of any sidewall of the building containing explosives to the eave line of any magazine, or building, or to a point 12 feet above the center of a railway or highway, will pass through such intervening natural or artificial barricade.

"Blasting Agent" shall mean any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting can when unconfined.

Note 1: A No. 8 test blasting cap is one containing 2 grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a cap of equivalent strength.

Note 2: Nitro-Carbo-Nitrate. This term applies to any blasting agent which has been classified as nitro-carbo-nitrate under the U.S. Department of Transportation Regulations, and which is packaged and shipped in compliance with the regulations of the U.S. Department of Transportation.

"Blasting Cap" shall mean a thin shell closed at one end and containing a detonating charge that is ignited by the flame from safety fuse. It is used for detonating explosives.

"Boosters" shall mean a casing containing several ounces of a high explosive used to increase the intensity of explosion of the detonator or a commercial detonating fuse.

corporations who engage in the transportation of articles or materials by rail, highway, water, or air.

"Commissioner" shall mean the commissioner of state police.

"Commercial Detonating Fuse" shall mean a flexible cord with a core of explosives.

"Detonating Primers" shall mean devices used to detonate bursting charges of projectiles for military purposes.

"Distributor" shall mean any person, firm, partnership, association or corporation acting as a manufacturer's agent or jobber who deals in explosives and sells to retail dealers or consumers.

"Electric Blasting Cap" shall mean a thin shell closed at both ends containing a detonating charge designed to be ignited by an electric current passed through the two insulated leg wires that project through the seal of the shell.

"Explosives" shall mean any and all explosives as defined in Section 29-343 of the General Statutes. Explosives are classified as follows:

"Class A Explosives" shall mean those possessing detonating or otherwise maximum hazard, such as, but not limited to, dynamite, nitroglycerin, picric acid, lead azide, fulminate of mercury, black powder, blasting caps and detonating primers.

"Class B Explosives" shall mean those possessing flammable hazard, such as propellant explosives (including smokeless powders), photographic flash powders, and some special fireworks.

"Class C Explosives" includes certain types of manufactured articles which contain Class A or Class B explosives, or both, as components but in restricted quantities.

"Explosive Bombs" shall mean a container filled with explosives and provided with a detonating device.

"Explosive-Actuated Power Devices" shall mean any tool or special mechanized device which is actuated by explosives, but not to include propellant-actuated power devices are jet tappers and jet perforators.

"Fire Marshal" shall mean the local fire marshal as defined in Section 29-297 of the General Statutes.

Forbidden or Not Acceptable Explosives" shall mean explosives which are forbidden or not acceptable for transportation by common carriers by rail freight, rail express, highway or water in accordance with the regulations or with the regulations of the U.S. Department of Transportation. Certain chemicals and certain fuel materials may have explosive characteristics which are not specifically classified by the U.S. Department of Transportation and are not readily classified for coverage in this code. Authoritative information must be obtained for such unclassified materials and action commensurate with their hazards, location, isolation and safeguards, shall be taken.

"Gunpowder" shall mean smokeless powder intended as a propellant explosive for small arms.

"Highway" shall mean any public street, public alley or public road.

"Inspector" shall mean a member of the state police department assigned to inspect premises, equipment, and conditions relative to the storage, transportation and use of explosives.

"Inhabited Building" shall mean a building or structure regularly used in whole or part as a place of human habitation. The term "inhabited building" shall also mean any church, school, store, railway passenger station, airport terminal for passengers, and any other building or structure where people are accustomed to congregate or assembly, but excluding any building or structure occupied in connection which the manufacture, transportation, storage and use of explosives.

"License" shall mean the authority granted by the commissioner of state police, in writing to manufacture, keep, store, sell, purchase, transport or use explosives. A license for the use of explosives shall not be issued until the applicant exhibits suitable competency and proficiency and shall submit to such examination and test as said commissioner may prescribe.

"Magazine" shall mean any building or structure, other than an explosives manufacturing building, approved for storage of explosives.

"Manufacturer" shall mean any person or persons, firm, partnership, association or corporation engaged in the manufacture of explosives.

"Motor Vehicle" shall mean any self-propelled vehicle, truck, tractor, semi-trailer, or truck-full trailer used for the transportation of freight over highways.

"Natural Barricade" shall mean natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

"Nitro-Carbo-Nitrate" shall mean any blasting agent which has been classified as nitro-carbo-nitrate under the U.S. Department of Transportation regulations, and which is packaged and shipped in compliance with the regulations of the U.S. Department of Transportation.

"No. 8 Test Blasting Cap" shall mean a blasting cap containing two grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a cap of equivalent strength.

"Permit" shall mean the authority granted by the state or local fire marshal in writing to have, keep, store, sell, transport, or use explosives. Such permits shall not be issued until the applicant exhibits an annual state license.

"Person" shall means any individual, firm, co-partnership, corporation, company, association, joint stock association, and

representative thereof.

"Propellant-Actuated Power Devices" shall mean any tool or special mechanized device or gas generator system which is actuated by smokeless propellant or which release and directs work through a smokeless propellant charge.

"Public Conveyance" shall mean any railroad car, street car, ferry, cab, bus, airplane or other vehicle which is carrying passengers for hire.

"Pyrotechnics" shall mean any and all fireworks as defined in Section 29-356 of the General Statutes.

"Railway" shall mean any steam, electric, diesel-electric or other railroad or railway which carries passengers for hire on the particular line or branch in the vicinity where explosives are stored or where explosive manufacturing buildings are situated.

"Retail Dealer" shall mean any person or persons, firm, partnership, association or corporation who sells explosives to users of same.

"Small Arms Ammunition" shall mean any shotgun, rifle, pistol or revolver cartridge, and cartridges for propellant-actuated power devices and industrial guns. Military-type ammunition containing high explosives, incendiary, tracer, spotting or pyrotechnic projectiles is excluded from this definition.

"Small Arms Ammunition Primers" (Definition of). Small percussion-sensitive explosive charges, encased in a cup, used to ignite propellant powder.

"Smokeless Propellants" shall mean solid propellants, commonly called smokeless powders in the trade, used in small arms ammunition, cannon, rockets, propellant-actuated power devices, etc.

"Special Industrial Explosives Devices" shall mean any explosive power-packs, which shall include but not be limited to explosive rivets, explosive bolts, tools and other charges of explosives used in special industrial operations including jet tapping steel furnaces and jet perforation in oil well operations.

"Special Industrial Explosive Materials" shall mean shaped materials and sheet forms and various other extrusion, pellets and packages of high explosives which include dynamite, trinitrotoluene, pentaerythrite tetra nitrate, cyclotrimethylene-trinitramine and other similar compounds used for high-energy-rate forming expanding and shaping in metal fabrication, and for dismemberment and quick reduction of scrap metal.

"Storage Farm" shall mean a tract of land properly segregated and used for the storage of explosives in excess of 50,000 pounds in one or more magazines.

"Water Gels or Slurry Explosives" comprise a wide variety of materials used for blasting. They all contain substantial proportions of water and high proportions of ammonium nitrate, some of which is in solution in the water. Two broad classes of water gels are: (a) those which are sensitized by a material classified as an explosive, such as TNT or smokeless powder, and (b) those which contain no ingredient such as aluminum or with other fuels; Water Gels may be premixed at an explosives plant or mixed at the site immediately before delivery into the borehole.
(Effective April 18, 1972)

Sec. 29-349-107. Classification

In these regulations, explosives are classified as follows: Class A - Dangerous: Class B - Less Dangerous.

Class A explosives shall include:

Ammunition for cannon with explosive projectiles
Ammunition for cannon with gas projectiles
Ammunition for cannon with illuminating projectiles
Ammunition for cannon with incendiary projectiles
Ammunition for cannon with smoke projectiles
Black Powder
Blasting caps - more than 1,000
Blasting caps with metal clad mild detonating fuse - more than 1,000
Boosters (explosives)
Bursters (explosives)
Charged oil well jet perforating guns (total explosive contents in exceeding 20 lbs. per motor vehicle)
Detonating primers
Electric blasting caps, more than 1,000
Explosive bomb
Explosive compositions
Explosive mine
Explosive projectile
Explosive torpedo
Fuses, detonating, Class A Explosives
Fuses, detonating Class A Explosives radioactive
Hand grenades
High explosives
High explosives, liquid
Igniters, jet thrust (jato) Class A explosives
Initiating explosive
Jet thrust unit (jato) Class A explosives
Low explosives
Propellant explosives, Class A

Rocket ammunition with explosive projectiles
Rocket ammunition with illuminating projectiles
Rocket ammunition with gas projectiles
Rocket ammunition with incendiary projectiles
Rocket ammunition with smoke projectiles
Supplementary charges (explosive)

Class B explosives shall includes

Ammunition for cannon with empty projectiles
Ammunition for cannon with inert-loaded projectiles
Ammunition for cannon with solid projectiles
Ammunition for cannon without projectiles
Commercial detonating fuse
Explosive compositions, other than Class A
Explosive power device, Class B
Fireworks, special
Igniters, jet thrust (jato) Class B explosives
Jet thrust unit (jato) Class B explosives
Propellant explosives (liquid) Class B
Propellant explosives (solid) Class B
Propellant explosives in water (smokeless powder for cannon or small farms)
Railway torpedos
Rocket ammunition with empty projectiles
Rocket ammunition with inert-loaded projectiles
Rocket ammunition with solid projectiles
Small arms primers in bulk
Smokeless powder for cannons
Smokeless powder for small arms
Starter cartridges, jet engine, Class B explosives

These regulations are intended to apply to the storage, transportation and use of Class A and Class B explosives as herein defined and are not applied to other explosives except insofar as may be practicable and in the interest of public safety. Industrialists and dealers engaged in the manufacture, processing, storage or transportation of explosives as defined in Section 29-83 of the General Statutes and not covered by these regulations shall secure a special permit from the state fire marshal.

(Effective April 18, 1972)

## CHAPTER II. LOCAL FIRE MARSHALS

### Sec. 29-349-108. Issuance of permits

Local fire marshals shall not issue a permit for any magazine

not meeting the minimum specifications set forth in these regulations.
(Effective April 18, 1972)

Sec. 29-349-109. Forwarding permits to commissioner

Local fire marshals shall retain a copy of each permit issued and shall immediately forward a copy of each permit to the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-110. Refusal of permit

No local fire marshal shall issue a permit to purchase, transport or use explosives until he is shown a license issued by the state fire marshal and is satisfied as to the identity of the applicant and as to what use will be made of the explosives.
(Effective April 18, 1972)

Sec. 29-349-111. Notification of permit refusal to State Fire Marshal

Whenever a local fire marshal shall refuse to issue a permit to any person for the purchase, transportation or use of explosives he shall immediately notify the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-112. Reporting violations

Whenever a local fire marshal finds evidence of a violation of a statute or regulation relative to the storage, transportation, or use of explosives, he shall immediately bring the matter to the attention of the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-113. Permit application

Every person desiring a permit to keep, store, sell, or deal in explosives shall make written application to the local fire marshal. Said application shall be in duplicate on forms provided by the state fire marshal. On receipt of such application, the local fire marshal shall proceed to make such inquiry as is necessary to determine whether the applicant is licensed by the state fire marshal and the magazine or premises meets all the requirements of these regulations and the applicable statutes. On finding that the magazine or premises complies with all statutory and regulatory requirements, the local fire marshal shall issue a permit to keep, store, sell and deal in explosives for a period of not more than one year. On

finding that the magazine or premises do not comply with all statutory or regulatory requirements, the fire marshal shall refuse to issue a permit. Said denial shall be in writing, and shall contain the reason for the refusal. The local fire marshal shall mail to the state fire marshal a copy of each application and each permit granted, or if the application was denied a copy of the denial.

(Effective April 18, 1972)

Sec. 29-349-114. Revocation of license or permit for violations.

Any license or permit issued in accordance with these regulations may be revoked at any time by the state fire marshal for good cause.

(Effective April 18, 1972)

## CHAPTER III. MANUFACTURING AND SALES OF EXPLOSIVES

Sec. 29-349-115. Manufacture of explosives

The manufacture of any explosive or small arms ammunition shall be prohibited within the State of Connecticut unless such manufacture is authorized by the state fire marshal and is conducted in accordance with recognized safe practices satisfactory to the state fire marshal. This shall not apply to hand loading of small arms and ammunition prepared for non-commercial use and not for resale, provided that no more than 50 pounds of smokeless powder and no more than 10,000 primers are kept in a single building. All primers and smokeless powder in such handloading operations must be kept in their factory containers except those which are placed in the loading device.

(Effective April 18, 1972)

Sec. 29-349-116. Manufacture of explosives when prohibited

The manufacture of explosives or pyrotechnics within the State of Connecticut shall be prohibited when such manufacture presents an undue hazard of life and property as determined by the state fire marshal.

(Effective April 18, 1972)

Sec. 29-349-117. When storage prohibited

No person shall store, handle or transport explosives or blasting agents when such storage, handling or transportation of explosives or blasting agents constitutes an undue hazard to life or property.

(Effective April 18, 1972)

Sec. 29-349-118. Licensed person to receive explosives

No person shall sell or give away any explosive or blasting agent to any person not holding a license to receive same
(Effective April 18, 1972)

Sec. 29-349-119. Prohibited in public places

No person shall sell, display or expose for sale any explosive or blasting agent on any highway, street, sidewalk, public way or public place.
(Effective April 18, 1972)

Sec. 29-349-120. Exemption for U.S. Pharmacopeia

Nothing in these regulations shall be construed to prohibit the use of explosives in the form prescribed by the official United States Pharmacopeia.
(Effective April 18, 1972)

Sec. 29-349-121. Requirements for laboratories and institutes

Industrial laboratories, laboratories of technical institutes, colleges, universities, and similar institutions may be permitted to keep, store and use explosives or blasting agents when confined to the purpose of scientific or technical instruction or research, provided the storage and use of explosives or blasting agents is conducted or supervised by a person licensed by the state fire marshal and not more than 50 pounds of explosives or blasting agents are kept on hand at any time in such laboratories. When additional quantities of explosives or blasting agents are required, application shall be made for special ruling by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-122. Restrictions of explosives quantities

The state fire marshal or the local fire marshal may restrict the quantity of explosives or blasting agents at any times, when such storage, handling or transportation constitutes an undue hazard to life or property.
(Effective April 18, 1972)

Sec. 29-349-123. Records

Each person, firm or corporation engaged in the manufacture of explosives, explosive compounds or fuse shall keep a daily record of each person other than employees entering upon their magazine site. Such information shall be filled in by the company's

Sec. 29-349-124. Receiver must be licensed

No person, firm or corporation shall sell, deliver, give or otherwise convey any explosives to any person, firm or corporation in this state who is not the holder of a permit or license from the state or local fire marshal, except as noted in Section 29-349-115.
(Effective April 18, 1972)

Sec. 29-349-125. Manufacturing of explosives. Protection

The entire occupied portion of the premises of an explosives manufacturing building shall be enclosed by a suitable fence to enable the management to have control of all persons entering such premises. There shall be sufficient number of notices conspicuously posted warning of the business conducted herein.
(Effective April 18, 1972)

## CHAPTER IV. STORAGE OF EXPLOSIVES

Sec. 29-349-126. Required magazines for explosives

Class I magazines shall be required where the quantity of explosives stored is more than 50 pounds. Class II magazines may be used where the quantity of explosives stored is 50 pounds or less, except that the authority having jurisdiction may authorize the use of Class II magazines for the temporary storage at blasting sites or larger quantities of explosives.
(Effective April 18, 1972)

Sec. 29-349-127. Requirements for classes of explosives

All Class A, Class B, and Class C special industrial explosives, and any newly developed and unclassified explosives, shall be kept in magazines which meet the requirements of these regulations. This shall not be construed as applying to the following:

(a) Stocks of small arms ammunition, propellant-actuated power cartridges, small arms ammunition primers in quantities of less than 750,000 and smokeless propellant in quantities of less than 750 pounds (see Chapter XII).
(b) Special industrial explosives devices when in quantities of less than 50 pounds net weight of explosives.
(c) Fuse lighters and fuse igniters.

(d) Safety fuse (safety fuse does not include cordeau detonating fuse).
(e) Explosives kept in the manufacturing area for manufacturing purposes.
(Effective April 18, 1972)

Sec. 29-349-128. Prohibited storage

No explosives in any quantity whatsoever shall be stored or kept in any building used in whole or in part as a school, theater or other place of public assembly or gathering.
(Effective April 18, 1972).

Sec. 29-349-129. Blasting Caps

Blasting caps, electric blasting caps, detonating blasting primers and primed blasting cartridges shall not be stored in the same magazine with other explosives.
(Effective April 18, 1972).

Sec. 29-349-130. Magazines to be locked

Each magazine shall be kept securely locked at all times, except when explosives are being placed therein or removed therefrom.
(Effective April 18, 1972)

Sec. 29-349-131. Authorized persons for magazines

Only competent authorized persons over 21 years of age shall have access to or control of magazines.
(Effective April 18, 1972)

Sec. 29-349-132. Storage or detonating fuse

Commercial detonating fuse shall be stored in an explosives magazine, but shall not be stored with blasting caps, electric blasting caps or primed cartridges.
(Effective April 18, 1972)

Sec. 29-349-133. Magazine inventory

A running inventory of the contents of each magazine shall be kept either in the office of the magazine keeper or in the magazine. This inventory shall be available for inspection by an inspector or by the local fire marshal. In the case of guarded storage farms or manufacturing areas, it will be sufficient if regularly scheduled daily or weekly inventories are made and appropriate records kept as mentioned above.
(Effective April 18, 1972)

Packages of explosives shall not be unpacked or repacked in a magazine nor within 50 feet of a magazine or in close proximity to other explosives. Tools used for opening packages of explosives shall be constructed of non-sparking materials. Opened packages of explosives shall be securely closed before being returned to a magazine.
(Effective April 18, 1972).

29-349-135. Smoking prohibited

Smoking, matches, open flames, spark producing devices and firearms are prohibited inside of or within 50 feet of any magazine or in or around any trucks, powder cars, wagons, or other vehicles containing explosives. Combustible materials shall not be stored within 50 feet of any magazine.
(Effective April 18, 1972)

Sec. 29-349-136. Adjacent land to be clear

Ground around permanent magazines shall slope away for drainage. The land surrounding magazines shall be kept clear of brush, dried grass, leaves and other combustible materials for a distance of at least 50 feet.
(Effective April 18, 1972)

Sec. 29-349-137. Explosives containers

Except while being used, no person shall have, keep or store explosives at any place within this state unless such explosives are completely encased or enclosed in metallic, wooden, rubber, fiber or plastic containers. Containers in which explosives are handled outside of manufacturing areas shall be plainly marked with the make and type of explosives contained therein.
(Effective April 18, 1972)

29-349-138. Cleaning of magazine floor stains

Magazine floors stained with nitroglycerin shall be scrubbed well with a stiff broom, hard brush or mop, using an ample volume of a solution in the proportion of 1 1/2 quarts of water, 3 1/2 quarts of denatured alcohol, one quart of acetone and one pound of sodium sulfide (60% commercial). The liquid shall be used freely to decompose the nitroglycerin thoroughly. In the event the nitroglycerin is on any material which is impervious to nitroglycerin, this area should be swept thoroughly with dry sawdust and destroyed by burning. Nitroglycerin remover should be stored in closed container and kept in a dark place. Nitro-

glycerin remover more than 60 days old shall not be used
(Effective April 18, 1972)

Sec. 29-349-139. Prohibited storage other than explosives

Magazines shall not be used for the storage of flammable materials, oil, paint, carbide, metal, metal tools, machinery or any other article with the exception of portable conveyors made of non-ferrous metals.
(Effective April 18, 1972)

Sec. 29-349-140. Storage of stock

All stocks of explosives shall be stored so as to be easily counted and checked. Packages of explosives shall be piled in a stable manner.
(Effective April 18, 1972)

Sec. 29-349-141. Alterations in magazine

No alteration changing the storage capacity of magazine shall be made without notifying the state or local fire marshal. When magazines need inside repairs, all explosives shall be removed therefrom. In making outside repairs, if there is a possibility of causing sparks or fire then the explosives shall be removed from the magazine. Explosives removed from a magazine under repair shall be either placed in another magazine or placed a safe distance from the magazine where they shall be properly guarded and protected until repairs have been completed, when they then shall be returned to the magazine.
(Effective April 18, 1972)

Sec. 29-349-142. Magazine housekeeping

Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from the floor of magazines shall be disposed of by burning in accordance with methods approved by the local or state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-143. Leaking or deteriorating explosives

When any explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or if nitroglycerin leaks from any explosive or if any explosive is unfit for use for any reason, or when any blasting caps, electric blasting caps, delay

electric blasting caps, electric squibs and delay electric squib have so deteriorated from age, improper storage or are unfit for use for any other reason, then the person in possession of such explosive or device shall immediately report the fact to the local fire marshal, and upon his authorization shall proceed to destroy such explosive or device in accordance with safe practices. Only competent persons shall do the work destroying these materials. Any manufacturer, distributor, wholesaler, dealer or user of explosives who files a description of his manner of destruction of these materials with the state fire marshal for approval may destroy these materials without authorization of the local fire marshal.
(Effective April 18, 1972)

29-349-144. Prohibited disposal

Detonators or explosives shall not be disposed of by throwing them into a body of water.
(Effective April 18, 1972)

Sec. 29-349-145. Empty containers

Except for such re-usable containers approved by the U.S. Department of Transportation, containers used in the manufacturing process and small arms cartridges, no explosive container, box liner, empty bags, sawdust or cartridge shall be used again for any purpose. Empty containers of the aforesaid types shall be carefully collected and destroyed in accordance with the instructions of the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-146. Reduction of capacity of magazine. Relocation

Whenever any buildings are erected or new railroad tracks or highways are constructed near a magazine, the permissive capacity of such magazine shall be reduced to conformity with the American Tables of Distances for the storage of explosives. Whenever any such new construction is begun requiring the reduction of the capacity of a magazine, such fact shall be reported to the state fire marshal without delay. The state or local fire marshal may order the magazine abandoned or relocated.
(Effective April 18, 1972)

Sec. 29-349-147. Initiator storage

Initiators (primary explosives) in bulk in an amount not exceeding 1,500 pounds at any one time, except at an explosives factory, shall be stored in a wet condition, and shall contain not less than 25% water.
(Effective April 18, 1972)

29-349-148. Guncotton storage

Guncotton, containing not less than 20% water, may be stored in an amount not exceeding 250,000 pounds at any one time in a building, provided such building is used exclusively for that purpose.
(Effective April 18, 1972)

29-349-149. Soluble or negative cotton storage

Soluble or negative cotton in a dry form may be kept for sale in a wholesale drug or photographic supply store in an amount not exceeding 6 pounds at any one time in packages containing not more than one ounce each, and may be kept for sale in a retail store in an amount not exceeding 2 pounds at any one time, in packages containing not more than one ounce each.
(Effective April 18, 1972)

Sec. 29-349-150. Removal of explosives

The state or local fire marshal may at his discretion, at any time he deems necessary for public safety, require the removal of any explosives from any location or require that a watchman be placed continuously in charge of same.
(Effective April 18, 1972)

Sec. 29-349-151. Inspection of magazines

All magazines will be periodically inspected by the local or state fire marshal and their agents, and the inspecting official shall notify the owner of a magazine not meeting the minimum safety factors set forth in these regulations to improve or abandon the magazine. Such notification shall be in writing and shall give the owner a reasonable length of time, taking all the surrounding circumstances into consideration, to complete the improvements or abandonment.
(Effective April 18, 1972)

Sec. 29-349-152. Reporting of accident, etc

All accidents, thefts or fires occurring with the keeping or storing of explosives shall be reported to the local fire marshal immediately by verbal communication and, within 24 hours, shall be reported in detail, in writing, to the state fire marshal on forms provided.
(Effective April 18, 1972)

Sec. 29-349-153. Lights in magazines

the applicable requirements of Articles 500 through 503 of the National Electrical Code consistent with the hazards present in the magazines. No other magazines shall be provided with artificial light, except that if artificial lights are necessary only electric safety flash lights or safety lanterns shall be used.

(Effective April 18, 1972)

## Sec. 29-349-154. Artificial heat in magazines

Artificial heat shall not be provided in magazines, except in manufacturing areas where artificial heating may be used only if low pressure steam or hot water is used as the heating medium.

(Effective April 18, 1972)

## 29-349-155. Magazine location

All magazines shall be located away from inhabited buildings, passenger railways, public buildings and other magazines in conformity with the American Table of Distances for the storage of explosives.

(Effective April 18, 1972)

## 29-349-156. Magazine construction

Magazines for the storage of Class A explosives shall be bullet-resistant, weather-resistant, fire-resistant, ventilated sufficiently to protect the explosive in the specific locality. Class 1 and Class 2 magazines shall be protected from lightning in accordance with the N.F.P.A. Lightning Protection Code. Magazines used only for the storage of Class B explosives shall be weather-resistant, fire-resistant and have ventilation. Magazines for the storage of blasting and electric blasting caps shall be weather-resistant, fire-resistant and ventilated. Underground storage in Class 1 and Class 2 magazines is prohibited without approval by the state fire marshal.

(Effective April 18, 1972)

## 29-349-157. Magazine classification

Magazines as required by these regulations shall be of four classes:

(a) Class 1 for the permanent storage of explosives.

(b) Class 2 for the temporary storage of explosives. This magazine must meet all the requirements of Class 1 magazine, except the foundation may be omitted and skids or wheels may be used.

(c) Class 3, daily supply magazine - capacity not to exceed 200 pounds, with or without wheels.
(d) Class 4, rental supply magazine - mounted on wheels, capacity not to exceed 50 pounds.
(Effective April 18, 1972)

Sec. 29-349-158. Magazine construction conformity

Magazines shall be constructed in conformity with the provisions of these regulations, or may be of substantially equivalent construction satisfactory to the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-159. Warning signs

Property upon which magazines are located outside of buildings shall be posted with signs, reading "Explosives - Keep Off." Such signs shall be located so as to minimize the possibility of bullet traveling in the direction of the magazines if anyone shoots at the sign.
(Effective April 18, 1972)

Sec. 29-349-160. Class 1 and Class 2 Magazines

Magazines of this category shall be of masonry construction or of wood or metal construction, or a combination of these types, and shall be bullet-resistant. Thickness of masonry units shall not be less than 8 inches. Hollow masonry units used in construction shall have all hollow spaces filed with weak concrete or well tamped sand. Wood constructed walls shall be constructed of 1-inch minimum thickness tongue and grooved hardwood lumber, shall have at least a six inch space between interior and exterior sheathing, and the space between sheathing shall be filled with well tamped sand. Metal wall construction shall be lined with brick at least four inches in thickness or shall have at least a six inch sand fill between interior and exterior walls, or may be constructed of 3/8 inch thick steel plate walls with 2 5/8 inch thick hardwood lining or equivalent construction approved by the state fire marshal. Interior walls shall be constructed of or covered with non-sparking material.
(Effective April 18, 1972)

Sec. 29-349-161. Floor and roof construction

Floors and roofs of masonry magazines may be of wood construction. Wood floors shall be tongue and grooved lumber having a minimum thickness of one inch.
(Effective April 18, 1972)

If the roof of a Class 1 or Class 2 magazine can be shot into from higher ground, it shall be protected by a sand tray or 4 inches of hardwood located at the line of eaves and covering the entire area except that necessary for ventilation. Sand in the sand tray shall be maintained at a depth of not less than 4 inches, or equivalent construction approved by the state fire marshal.
(Effective April 18, 1972).

Sec. 29-349-163. Exterior magazine covering

All wood at the exterior of magazines, including eaves, shall be protected by being covered with black or galvanized steel or aluminum metal of thickness not less than No. 26 gauge. All nails exposed to the interior shall be well countersunk.
(Effective April 18, 1972)

Sec. 29-349-164. Foundations

Foundations for magazines shall be of substantial construction and arranged to provide good cross ventilation. The ground around such foundations shall slope away sufficiently for proper drainage.
(Effective April 18, 1972)

Sec. 29-349-165. Ventilation

Magazines shall be ventilated sufficiently to prevent dampness and heating of stored explosives. Ventilating openings shall be screened to prevent the entrance of sparks.
(Effective April 18, 1972)

Sec. 29-349-166. Magazine door construction

Openings to magazines shall be restricted to that necessary for the placement and removal of stocks of explosives. Doors shall be constructed of 3/8 inch plate steel and lined with 2 5/8 inches of hardwood. Hinges and hasps shall be attached to the doors by welding, riveting or bolting (nuts on inside of door). They shall be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.
(Effective April 18, 1972)

Sec. 29-349-167. Magazine locking and protection

Magazines shall be provided with substantial means for locking and protection. A complete tamper proof locking assembly,

approved by the state fire marshal, shall be provided and magazine doors shall be kept locked, except during the time of placement and removal of stocks of explosives. When deemed necessary by the state fire marshal, due to unusual hazard, such magazines shall be enclosed by at least a six foot manproof fence, and/or shall be further protected by continuous surveillance by an electronic sensing device which shall notify the proper authorities upon unauthorized penetration of the magazine area.
(Effective April 18, 1972)

Sec. 29-349-168. Prohibited stock piling

Provisions shall be made to prevent the piling of stocks of explosives directly against masonry walls, brick lined or sand filled metal walls and single thickness metal walls; such protection, however, shall not interfere with proper ventilation at interior of side and end walls.
(Effective April 18, 1972)

Sec. 29-349-169. Class 3 and Class 4 magazines

Magazines shall be of wood or metal construction or a combination thereof.
(Effective April 18, 1972

Sec. 29-349-170. Wood and metal magazine construction

Wood magazines of this class shall have sides, bottom, and cover constructed of 2 inch thick hardwood boards well braced at corners and protected by being entirely covered with sheet metal of not less than No. 20 gauge. All nails exposed to interior of the magazine shall be well countersunk. All metal magazines of this class shall have sides, bottom, and cover constructed of sheet metal, and shall be lined with 3/8 inch plywood or the equivalent, including nonferrous metal. Edges of metal covers shall overlap sides at least one inch.
(Effective April 18, 1972)

Sec. 29-349-171. Magazine cover construction

Covers for both wood and metal constructed magazines of these classes shall be provided with substantial strap hinges and shall be provided with substantial means of locking. Covers shall be kept locked except during the placement and removal of explosives.
(Effective April 18, 1972)

Sec. 29-349-172. Warning signs

lettering in white, on all sides and top, at least 3 inches high, "Explosives - Keep Fire Away" - Class 4 magazines when located in warehouses, wholesale or retail establishments, shall be provided with substantial wheels or casters to facilitate removal in case of fire.
(Effective April 18, 1972)

29-349-173. Ventilation

Class 3 and Class 4 magazines shall provide adequate means of ventilation.
(Effective April 18, 1972)

Sec. 29-349-174. Explosives storage within building

Class 4 magazines shall be permitted in warehouses, wholesale and retail establishments when located on a floor which has an entrance at outside grade level and the magazine is located not more than 10 feet from such an entrance. Two Class 4 magazines may be located in the same building when one is used for blasting caps in quantities not in excess of 5,000 caps and a distance of 10 feet is maintained between magazines. The location of a Class 4 magazines within a building shall not be changed without the approval of the state or local fire marshal.
(Effective April 18, 1972)

29-349-175. Class 3 magazines. Limitation on storage

Not more than 200 pounds of explosives shall be stored or kept in a Class 3 magazine. No explosives shall be kept at night or when blasting is inactive in a Class 3 magazine except under conditions approved by local fire marshal or the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-176. Class 4 magazines. Limitation on storage

Not more than 50 pounds of explosives shall be stored or kept in a Class 4 magazine.
(Effective April 18, 1972)

## CHAPTER V. TRANSPORTATION OF EXPLOSIVES

Sec. 29-349-177. Permits by local fire marshal

No local fire marshal shall issue a permit to transport more than 50 pounds of explosives or more than 1,000 blasting caps or electric blasting caps in any suitable vehicle. A local fire

marshal may issue a permit to transport a maximum of 200 pounds of explosives in a vehicle carrying a Class 3 magazine or its equivalent. The transportation of blasting caps or electric blasting caps in the same vehicle containing other explosives is prohibited.
(Effective April 18, 1972)

Sec. 29-349-178. Permits by state fire marshal

Only the state fire marshal, or his designated representatives shall approve and issue permits for the transportation of explosives in vehicles carrying more than 200 pounds of explosives or more than 1,000 blasting caps or electric blasting caps, and such vehicles shall meet all the requirements of the state fire marshal as set forth in these regulations.
(Effective April 18, 1972)

Sec. 29-349-179. Vehicle approval

Vehicles transporting more than 200 pounds of explosives or more than 1,000 blasting caps or electric blasting caps shall be required to have the approval of the state fire marshal. Vehicles of this classification shall be a truck or truck-tractor with semi-trailer.
(Effective April 18, 1972)

Sec. 29-349-180. Blasting cap transportation

A maximum of 5,000 blasting caps or electric blasting caps may be transported on the same approved vehicle as follows: The blasting caps or electric blasting caps shall be packed in authorized D.O.T. specifications outside shipping containers; or in prescribed inside D.O.T. packages in an outside box made of one inch lumber with suitable padding material not less than one-half inch thick, or a box made of not less than 12 gauge sheet metal lined with plywood or other suitable material not less than 3/8 inch thick so that no metal is exposed. Hinged cover and fastening devices are required on such boxes. These boxes shall be loaded in approved vehicles so that contents or box will be immediately accessible for removal.
(Effective April 18, 1972)

Sec. 29-349-181. Loading or unloading precautions

In loading or unloading any explosives or blasting caps or electric blasting caps, care shall be taken in the handling of same, and they shall be so placed or stowed as to prevent displacement during transit.
(Effective April 18, 1972)

The body of each such vehicle shall be fully enclosed. The doors shall be equipped with strong hinges securely bolted on the inside and provided with two suitable padlocks which shall be kept locked at all times when explosives are being carried. The underside of the body, together with the front end and sides of the body, shall be made fire-resistive by being covered with 1/4 inch of sheet asbestos which, in turn shall be covered by 20 gauge galvanized iron or equivalent. The entire body, including the doors, should be so constructed that no bolt, screws, nails, or other metals shall be exposed on the inside thereof. Any exposed spark-producing metal on the inside of the body shall be covered with wood or other non-sparking material to prevent contact with packages of explosives.
(Effective April 18, 1972)

Sec. 29-349-183. Warning signs

Each vehicle carrying explosives shall bear signs on the front, rear and each side bearing the word "EXPLOSIVES" in letters not less than 4 inches in height. The lettering shall be in white. Approved vehicles shall be painted in a bright red.
(Effective April 18, 1972)

Sec. 29-349-184. Owner to inspect

It shall be the duty of the person to whom a permit has been issued to transport explosives in vehicles of this classification to inspect daily or cause to be inspected daily those vehicles employed by him to determine that:

(a) Fire extinguishers are filled and in operation condition.
(b) Electric wires are insulated and securely fastened to prevent short circuit.
(c) The motor, chassis and body are resonably clean and free of excess grease and oil.
(d) The fuel tank and fuel lines are securely fastened and not leaking.
(e) Brakes, lights, horn, windshield wiper, and steering mechanism are functioning properly.
(f) Tires are properly inflated and free of defects.
(g) The vehicles shall be in proper condition in every other respect and acceptable for handling explosives.
(H) All warning signs are clean and clearly legible.
(Effective April 18, 1972)

Sec. 29-349-185. Fire extinguishers

The body of each such vehicle shall be fully enclosed. The doors shall be equipped with strong hinges securely bolted on the inside and provided with two suitable padlocks which shall be kept locked at all times when explosives are being carried. The underside of the body, together with the front end and sides of the body, shall be made fire-resistive by being covered with 1/4 inch of sheet asbestos which, in turn shall be covered by 20 gauge galvanized iron or equivalent. The entire body, including the doors, should be so constructed that no bolt, screws, nails, or other metals shall be exposed on the inside thereof. Any exposed spark-producing metal on the inside of the body shall be covered with wood or other non-sparking material to prevent contact with packages of explosives.
(Effective April 18, 1972)

Sec. 29-349-183. Warning signs

Each vehicle carrying explosives shall bear signs on the front, rear and each side bearing the word "EXPLOSIVES" in letters not less than 4 inches in height. The lettering shall be in white. Approved vehicles shall be painted in a bright red.
(Effective April 18, 1972)

Sec. 29-349-184. Owner to inspect

It shall be the duty of the person to whom a permit has been issued to transport explosives in vehicles of this classification to inspect daily or cause to be inspected daily those vehicles employed by him to determine that:

(a) Fire extinguishers are filled and in operation condition.
(b) Electric wires are insulated and securely fastened to prevent short circuit.
(c) The motor, chassis and body are resonably clean and free of excess grease and oil.
(d) The fuel tank and fuel lines are securely fastened and not leaking.
(e) Brakes, lights, horn, windshield wiper, and steering mechanism are functioning properly.
(f) Tires are properly inflated and free of defects.
(g) The vehicles shall be in proper condition in every other respect and acceptable for handling explosives.
(H) All warning signs are clean and clearly legible.
(Effective April 18, 1972)

Sec. 29-349-185. Fire extinguishers

Vehicles containing explosives shall not be taken into a garage or repair shop for repair or storage.
(Effective April 18, 1972)

Sec. 29-349-192. Vehicle to be attended

Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by the driver or other qualified attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers. He shall have been made familiar with the vehicle he is assigned to attend, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.

(a) For the purpose of this section, a vehicle shall be deemed "Attended" only when the driver or other qualified attendant is physically on or in the vehicle, or has the vehicle within his field of vision and can reach it quickly and without any kind of interference; "attended" also means that the driver or attendant is awake, alert and not engaged in other duties or activities which may divert his attention from the vehicle, except for necessary communication with public officers, or representatives of the carrier, shipper or consignee.

(b) However, an explosive laden vehicle may be left unattended if parked within a securely fenced or walled area with all gates or entrances locked, in a non-hazardous location, where the parking of such vehicle is otherwise permissible.
(Effective April 18, 1972)

Sec. 29-349-193. Certain substances prohibited

No spark-producing metal, or spark-producing metal tools, oils, matches, firearms, electric storage batteries, flammable substances, acids, oxidizing materials, or corrosive compounds shall be carried in the body of any motor truck and/or vehicle transporting explosives, unless the loading of such dangerous articles and the explosives comply with the U.S. Department of Transportation regulations.
(Effective April 18, 1972)

Sec. 29-349-194. Transfer of explosives

Explosives shall not be transferred from one vehicle to another within the State of Connecticut without informing the local fire and police authorities. In the event of a breakdown or colli-

sion, the local fire and police departments and the state police department shall be promptly notified to help safeguard such emergencies. Explosives shall be transferred from the disabled vehicle to another only when proper and qualified supervision is provided.
(Effective April 18, 1972)

Sec. 29-349-195. Vehicle parking restrictions

Except under emergency conditions, no vehicle transporting explosives shall be parked before reaching its destination, even though attended, on any street adjacent to or in proximity to any bridge, tunnel, dwelling, building or place where people work, congregate or assembly.
(Effective April 18, 1972)

29-349-196. Distance between vehicles

Vehicles loaded with explosives shall keep at least 1,000 feet apart.
(Effective April 18, 1972)

29-349-197. Passengers prohibited

Unauthorized persons shall not ride in vehicles transporting explosives.
(Effective April 18, 1972)

29-349-198. Smoking and carrying firearms prohibited

No person shall smoke, carry matches or any flame-producing device, or carry any firearms or loaded cartridges (except law enforcement officers in the performance of their duties) in or near a motor vehicle transporting explosives; or drive, load or unload such vehicle in a careless or reckless manner.
(Effective April 18, 1972)

29-349-199. Packing

When explosives are being transported, they shall be packed in strong containers suitable for the purpose. Each box container, or case shall be plainly marked stating the make and type of explosive contained therein.
(Effective April 18, 1984)

29-349-200. Vehicle loading and delivery of explosives

Vehicles shall be loaded in such a manner as to prevent displacement during transit. No bail-hook or metal tools, except

loading or unloading explosives. Delivery shall only be made to authorized persons and into authorized magazines or approved temporary storage or handling areas.
(Effective April 18, 1972)

29-349-201. Railroad cars

All railroad cars loaded with explosives shall be promptly unloaded and their contents transported to licensed magazines in approved vehicles. Except during the actual unloading, such cars shall be securely locked.
(Effective April 18, 1972)

Sec. 29-349-202. Interstate transportation

There shall be no interstate transportation of explosives into this state except in accordance with the rules and regulations of the U.S. Department of Transportation.
(Effective April 18, 1972)

## CHAPTER VI. USE OF EXPLOSIVES AND BLASTING AGENTS

29-349-203. Record of shots fired

Each user of explosives for commercial blasting purposes shall keep a log book showing in detail, shots fired by him, giving the quantity of explosives used in each shot, the types, the date, time, name of the land owner, location in which the shot was fired, and the authority issuing the permit. Records shall be in a bound book not loose-leaf, and shall include the number of holes, diameter, depth and spacing, pounds, and type of explosives used, number of delay fuses, results of blast, and precautions taken.
(Effective April 18, 1972)

29-349-204. User, without magazine, limited to daily requirements

No user of explosives not having a licensed magazine shall have in his possession explosives beyond his daily requirements.
(Effective April 18, 1972)

Sec. 29-349-205. Experienced persons only

The handling of explosives may be performed by the person holding a permit to use the explosives or by other employees under his direct supervision provided that such employees are at least 21 years of age.
(Effective April 18, 1972)

Sec. 29-349-206. Protection of persons and property

(a) Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags, barricades or woven wire mats to insure the safety of the general public and workmen.

(b) In every case where a possibility exists either of a serious complaint or actual property damage from blasting vibration, the user shall provide approved seismic instrumentation to determine the actual magnitude of such ground vibration. The state fire marshal, may, on his own initiative, order the use of such instrumentation conducted by a professional service, and may determine the maximum vibration level.

(Effective April 18, 1972)

Sec. 29-349-207. On the job explosives. Container

Original containers or Class 3 magazines shall be used for taking detonators and other explosives from storage magazines to the blasting area.

(Effective April 18, 1972)

29-349-208. Smoking, drugs, liquor. Prohibited

When explosives are being handled or used, smoking shall not be permitted and no one near the explosives shall possess matches, open light of other fire or flame. No person shall handle explosives when under the influence of liquor or drugs.

(Effective April 18, 1972)

29-349-209. Blasting precautions

When blasting is done in congested areas or in close proximity to a structure, railway or highway or any other installation that may be damaged, the blaster shall take special precautions in the loading, delaying, initiation and/or confinement of each blast with mats or other methods so as to control the throw of fragments, and thus prevent bodily injury or property damage.

(Effective April 18, 1972)

Sec. 29-349-210. Blasting on Sunday

Blasting operations may not be conducted on Sundays or between sunset and sunrise, except with special permission of the state of local fire marshal.

(Effective April 18, 1972)

Sec. 29-349-211. Removal of explosives from magazine

Sec. 29-349-212. Blasting precautions for areas of public utilities

Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph and steam utilities, the blaster shall notify the appropriate representative of such utilities and the local fire marshal at least 24 hours in advance of blasting, specifying the location and intended time of such blasting. Verbal notice shall be confirmed with written notice. In an emergency, this time limit may be waived by the state or local fire marshal.
(Effective April 18, 1972)

Sec. 29-349-213. Warning signs

During the period of any blasting operation which is being initiated electrically, the blaster, contractor, or person in charge shall cause signs to be erected on all adjacent highways at a point 350 feet from the blasting site to warn motorists not to use two-way radios. These signs shall be placed on the road just prior to the loading of the holes, and shall be removed immediately after the blast is completed.
(Effective April 18, 1972)

Sec. 29-349-214. Blasting caps

Electric blasting caps of different manufacturers shall not be used in the same blast regardless of the manner of connection.
(Effective April 18, 1972)

Sec. 29-349-215. Amount of explosive at blast site

Under no circumstances shall the amount of explosives taken into a blast area exceed the amount estimated by the blaster as necessary for the blast. Such explosives shall be properly stacked and at such distance apart that any premature explosion will not be likely to propagate from one pile to another.
(Effective April 18, 1972)

Sec. 29-349-216. Empty containers. Destruction

Empty boxes and paper and fiber packing materials which have previously contained explosives shall not be used again for any purpose, but shall be destroyed by burning at an approved isolated location out of doors, and no person shall be nearer

than 100 feet after the burning has started.
(Effective April 18, 1972)

29-349-217. Use of damaged material

Explosives or blasting equipment that are obviously deteriorated or damaged shall not be used.
(Effective April 18, 1972)

29-349-218. Abandoned explosives

No explosives shall be abandoned.
(Effective April 18, 1972)

Sec. 29-349-219. Open flames prohibited

No open flame light shall be used in the vicinity of explosives.
(Effective April 18, 1972)

Sec. 29-349-220. Blasting operations

Blasting operations shall be conducted in accordance with nationally recognized good practices.
(Effective April 18, 1972)

29-349-221. Water soaked explosives

No person shall attempt to reclaim or use blasting caps, electric blasting caps or other explosives that have been water soaked, even if dried out.
(Effective April 18, 1972)

Sec. 29-349-222. Minimum current

A circuit shall not be fired electrically with less than the minimum current specified by the manufacturer.
(Effective April 18, 1972)

Sec. 29-349-223. Blasting cap containers

Electric blasting caps shall be kept in their original container or in a closed metal box lined with a soft material such as wood or sponge rubber. The coils and folds in the wires of electric blasting caps should not be straightened out until made ready for use.
(Effective April 18, 1972)

Sec. 29-349-224. Extraneous electricity hazards

Blasting areas shall be surveyed for possible hazards caused extraneous electricity. Non electric initiation shall be used a current testing device shows more than 0.06 ampere.
(Effective April 18, 1972)

29-349-225. Drill hole size

All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives.
(Effective April 18, 1972)

Sec. 29-349-226. Tamping

Tamping shall be done only with wood rods without exposed metal joints, but non-sparking metal connectors may be used for jointed poles. Plastic tamping poles may be used, provided they have been approved by the state fire marshal. Violent tamping shall be avoided.
(Effective April 18, 1972)

Sec. 29-349-227. Loading of holes

No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives shall be immediately returned to an authorized magazine.
(Effective April 18, 1972)

Sec. 29-349-228. Examination for unexploded explosives

Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be handled by or under the supervision of a competent and experienced person.
(Effective April 18, 1972)

29-349-229. Deepening drill holes

No person shall deepen drill holes which have contained explosives.
(Effective April 18, 1972)

Sec. 29-349-230. Loading holes completed - return explosives to magazine

After loading for a blast is completed, all excess blasting caps or electric blasting caps and other explosives shall immediately be returned to their separate storage magazines.
(Effective April 18, 1972)

29-349-231. Fuses. Length

Safety fuse shall be cut sufficiently long to extend beyond the collar of the hole, and sufficient in length to assure ample time in retiring from the blast, and shall be not less than three feet in length.
(Effective April 18, 1972)

Sec. 29-349-232. Fuses into cap

Safety fuse shall be cut squarely across and not at a slant. At least one inch of safety fuse shall be cut off, and the freshly cut end immediately inserted into the blasting cap and crimped with a standard crimper so that the safety fuse is seated against the detonating composition in the cap.
(Effective April 18, 1972)

Sec. 29-349-233. Cartridges

Cartridges for use in blasting shall be primed only as required for immediate use.
(Effective April 18, 1972)

Sec. 29-349-234. Leading wires

Rubber covered or equally insulated wires in good condition shall be used for leading wires. Permanent lines shall be properly supported and insulated and of sufficient size to provide theoretical current requirements for the maximum proposed blast allowing for the ultimate length of the firing line. The firing circuit should be kept completely insulated from the ground or other conductors such as bare wires, tails, pipes or other paths of stray currents.
(Effective April 18, 1972)

Sec. 29-349-235. Equipment of blaster

Each blaster shall be equipped with a galvanometer and blasting machine in good working order; and shall be further equipped with fuse cutters and cap crimpers if cap and fuse is used.
(Effective April 18, 1972)

Sec. 29-349-236. Short circuiting leading wires

Prior to firing shots electrically, the leading wires shall be kept short circuited until ready to actually fire the shot.
(Effective April 18, 1972)

29-349-237. Testing of circuits

blasting galvanometers designed for this p
(Effective April 18, 1972)

29-349-238. Loading and drilling restricted

No loading operation shall be conducted within 25 feet of a drilling operation.
(Effective April 18, 1972)

29-349-239. Springing holes

Drill holes shall not be sprung unless they are more than 100 feet from the nearest hole containing explosives. Holes that have been sprung shall not be charged with explosives until the maximum temperature in any portion of such hole has been reduced to less than 150 degrees F. If an accurate method of measuring the temperature is not avilable, the hole shall not be reloaded for at least two hours. Sprung holes may be cooled by the addition of sufficient water.
(Effective April 18, 1972)

Sec. 29-349-240. Stemming

Stemming shall consist of clean fine clay, sand or crushed rock screenings. The use of leaves or trash is prohibited. Each blast hole shall be stemmed to the collar or to a point high enough to provide sufficient confinement of the charge and to minimize the chance of injury to personnel from flying material.
(Effective April 18, 1972)

29-349-241. Misfire. Suspected

If a misfire is suspected, all wires or commerical detonating fuse in broken rock shall be carefully traced and search made for unexploded cartridges. If recovery is not made, the local fire marshal shall be notified.
(Effective April 18, 1972)

Sec. 29-349-242. Misfire. Investigation

No person shall be permitted to examine a shot after a misfire until specifically authorized by the person in charge of the blasting operations. If practicable, the misfired charge shall be re-primed and fired. Misfires shall be handled only by or under the direction of a competent and experienced person.
(Effective April 18, 1972)

Sec. 29-349-243. Misfire. Precautions

If a misfire occurs or is suspected, no person shall return to the vicinity of the misfire until at least one hour after the misfire if the shot was cap and fuse firing, or minimum of 30 minutes for electric firing. If there is reason to believe that the explosive is burning in the hole, no person shall return to the vicinity of the misfire for at least 12 hours, and the site shall be guarded in the interim.
(Effective April 18, 1972)

Sec. 29-349-244. Airline hose prohibited within twenty-five feet

In no case shall an airline hose be permitted to be located within 25 feet of a loading operation or a space where explosives are stored or handled.
(Effective April 18, 1972).

Sec. 29-349-245. Loaded holes to be guarded. Warning whistle

When a charge of explosives has been loaded there shall be a constant guard over same until the blast is fired. Before a blast is fired, a loud warning signal shall be given by the person in charge, who has made certain that all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and that an adequate warning has been given. Said guard shall remain until the person in charge is reasonably certain there have been no misfires.
(Effective April 18, 1972)

Sec. 29-349-246. Blasting caps in congested areas

Only electric blasting caps or commercial detonating fuse shall be used for blasting operations in congested districts, or on highways, or adjacent to highways open to traffic, except where sources of extraneous electricity make such use dangerous.
(Effective April 18, 1972)

Sec. 29-349-247. Cap crimpers

When fuse is used, the blasting cap shall be securely attached to the fuse with a standard ring type cap crimper. All primers shall be assembled at least 50 feet from any magazine.
(Effective April 18, 1972)

Sec. 29-349-248. Accidents, thefts, fires to be reported

All accidents, thefts or fires occurring with the use of explosives shall be reported to the local fire marshal immediately by verbal communication and, within 24 hours, shall report in detail the chronological events pertaining to same, in

iting, to the state fire m
(Effective April 18, 1972)

Sec. 29-349-249. Inserting. Blasting caps

No blasting cap shall be inserted in the explosives without first making a hole in the cartridge for the cap with a wooden or non-ferrous metal punch of proper size or standard cap crimper.
(Effective April 18, 1972)

Sec. 29-349-250. Misfired explosives, not to be dug out

Explosives shall not be extracted from a hole that has once been charged or has misfired unless it is impossible to safely detonate the unexploded charge by insertion of a fresh additional primer.
(Effective April 18, 1972)

Sec. 29-349-251. Lead wire connector to fire shot

Only the man making leading wire connections in electric firing shall fire the shot. All connections should be made from bore hole back to the source of the firing current, and the leading wires shall remain shorted and not be connected to the blasting machine or other source of current until the charge is to be fired.
(Effective April 18, 1972)

Sec. 29-349-252. Extraneous electricity. Precautions

Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, adjacent power lines, lightning, dust storms and other sources of extraneous electricity. The precautions shall include:
(a) The suspension of all blasting operations regardless of the method of initiation and removal of persons from the blasting area during the approach and progress of an electric storm.
(b) Special precautions may be required by the state fire marshal when blasting operations are conducted in a radar environment.
(c) Electric blasting shall not be carried out at lesser distances from radio transmitter antennas than is set forth in the following table:

Distances for AM Transmitters (Fixed or Mobile)

| Transmitter Power in Watts | Minimum Distance in Feet |
|---|---|
| 5 - 25 | 100 |

| Transmitter Power in Watts | Minimum Distance in Feet |
|---|---|
| 25 - 50 | 150 |
| 50 - 100 | 220 |
| 100 - 250 | 350 |
| 250 - 500 | 450 |
| 500 - 1,000 | 650 |
| 1,000 - 2,500 | 1,000 |
| 2,500 - 5,000 | 1,500 |
| 5,000 - 10,000 | 2,200 |
| 10,000 - 25,000 | 3,500 |
| 25,000 - 50,000 | 5,000 |
| 50,000 - 100,000 | 7,000 |

Distances for FM Mobile Transmitters

| Transmitter Power in Watts | Minimum Distance in Feet |
|---|---|
| 1 - 10 | 5 |
| 10 - 30 | 10 |
| 30 - 60 | 15 |
| 60 - 250 | 30 |
| 250 - 600 | 45 |

Where the power of an FM or TV transmitter exceeds 100,000 watts, electric blasting shall be conducted at a distance of at least 600 feet or more. No electric blasting will be carried out at lesser distances than in the aforesaid tables without the specific permission of the state fire marshal.
(Effective April 18, 1972)

## CHAPTER VII. EXPLOSIVES AT PIERS, RAILWAY STATIONS AND CARS OR VESSELS NOT OTHERWISE SPECIFIED IN THESE REGULATIONS

### Sec. 29-349-253. Railroad cars

Except in an emergency, and with the permission of the state fire marshal, no person shall have or keep explosives in a railway car unless said car and contents and methods of loading are in accordance with the U.S. Department of Transportation regulations for the transportation of explosives.
(Effective April 18, 1972)

### Sec. 29-349-254. Packing to conform to D.O.T. regulations

No person shall deliver any explosives to any carrier unless such explosive conforms in all respects, including marking and

packaging to the U.S. Department of Transportation regulations for the transportation of explosives.
(Effective April 18, 1972)

Sec. 29-349-255. Warning signs

Every railway car containing explosives which has reached its destination, or is stopped in transit so as no longer to be in interstate commerce shall have attached to both sides and ends of the car, cards with the words "EXPLOSIVES - HANDLE CAREFULLY - KEEP FIRE AWAY" in red letters at least one and one-half inches high on a white background.
(Effective April 18, 1972)

29-349-256. Explosives to be isolated at terminals

Any explosives at a railway facility, truck terminal, pier, wharf, harbor facility or airport terminal whether for delivery to a consignee or forwarded to some other destination shall be kept in a safe place, isolated as far as is practicable and in such manner that they can be easily and quickly removed.
(Effective April 18, 1972)

29-349-257. Delivery between sunset and sunrise

Explosives shall not be delivered to or received from any railway station, truck terminal, pier, wharf, harbor facility or airport terminal between the hours of sunset and sunrise without notifying the local fire marshal, who shall take appropriate steps to assure the safety of the public.
(Effective April 18, 1972)

29-349-258. Unclaimed or undelivered explosives

Whenever explosives brought into this state by any means of transportation for delivery to an intermediate receiver, consignee's agent or consignee, or to be forwarded to some other destination, shall remain unclaimed or undelivered for 48 hours (Sundays and holidays excluded) such shipper shall notify the local fire marshal. The local fire marshal shall then order the transportation company to move said explosives to an approved storage magazine or place of safety and the cost of such movement shall be borne by the shipper of the explosives.
(Effective April 18, 1972)

Sec. 29-349-259. Consignee to remove explosives

Any person having been notified, as consignee, of a shipment of explosives being in the hands of any carrier shall remove the

said explosives within 48 hours, Sundays and holidays excluded, after receiving such notification, to a place meeting the requirements of these regulations.
(Effective April 18, 1972)

Sec. 29-349-260. Authority to designee location and quantity of explosives

The local fire marshal has the authority to and may designate the location for, and limit the quantity of, explosives which may be loaded, unloaded, reloaded, or temporarily retained at any facility within his jurisdiction.
(Effective April 18, 1972)

29-349-261. Permits for waterfront facilities.

Before the owner or operator of a waterfront facility shall handle, load, discharge, transport on or over such facility any Class A explosive in any quantity, he shall hold a permit issued by the local fire marshal. The owner or operator of a waterfront facility shall notify the fire marshal when the quantity of Class B explosives present on the facility is in excess of one ton. No permit shall be issued by the local fire marshal for the loading or discharging to or from any vessel any explosives unless such explosives are marked, labeled and packaged in accordance with D.O.T. regulations and meet the regulations of the United States Coast Guard. Such fire marshal shall specify the limits as to maximum quantity, isolation and remoteness. Nothing herein contained shall be deemed to limit or restrict the shipment, transportation or handling of military explosives by or for the Armed Forces of the United States.
(Effective April 18, 1972)

## CHAPTER VIII. BLASTING AGENTS

Section 29-349-262. Application of regulations

Unless otherwise set forth in these regulations, blasting agents shall be transported, stored and used in the same manner as explosives.
(Effective April 18, 1972)

29-349-263. Facilities used for mixing blasting agents

(a) Buildings or other facilities used for mixing blasting agents shall be located, with respect to inhabited buildings, passenger railroads and public highways, in accordance with the American Table of Distances.

(b) Any ammonium nitrate stored at a closer distance to the blasting agent storage area than as provided in (c) below shall be added to the quantity of blasting agents to calculate the total quantity involved for application of the aforementioned Table.

(c) Minimum intra-plant separation distances between mixing units and the ammonium nitrate storage areas and blasting agent storage areas shall be in conformity with the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents

(Effective April 18, 1972)

Sec. 29-349-264. Buildings used for mixing of blasting agents

(a) Buildings used for the mixing of blasting agents shall conform to the requirements of this section, unless otherwise specifically approved by the state fire marshal.

(b) Buildings shall be of noncombustible construction or sheet metal on wood studs.

(c) The layout of the mixing building shall be such as to provide physical separation between the finished product storage, and the mixing and packaging operation.

(d) Floors in the storage areas and in the processing plant shall be of concrete, metal or other approved material. Isolated fuel storage shall be provided to avoid contact between molten ammonium nitrate and fuel in case of fire.

(e) The building shall be well ventilated.

(f) Heat shall be provided exclusively from a source outside the building. However, space heaters that do not depend on combustion processes within the heating unit may be satisfactory if they are located overhead to provide a minimum clearance of 30 inches from raw materials and finished products. The space heaters must also meet the requirements of the most recent edition of the National Electrical Code for the specific type of hazard encountered.

(Effective April 18, 1972)

Sec. 29-349-265. Mixer design

The design of the mixer shall be such as to minimize the possibility of frictional heating, compaction, and especially confinement. Open mixers are preferable to enclosed mixers. Bearing and gears should be protected against the accumulation of ammonium nitrate dust. All surfaces should be accessible for cleaning. Mixing and packaging equipment shall be constructed of materials compatible with fuel-ammonium nitrate composition.

(Effective April 18, 1982)

29-349-266. Determination of blasting agent compositions

The provisions of this section shall be considered when determining blasting agent compositions. The sensitivity of the blasting agent shall be determined by means of a No. 8 test blasting cap at regular intervals and after every change in formulation or as may be required by the state fire marshal.

(a) Oxidizers of small particle size such as crushed prills or fines may be more sensitive and hazardous than the ordinary prills and shall be handled with greater car.

(b) No liquid fuel with flash point lower than that of No. 2 diesel fuel oil (125 degrees F. minimum or legal) shall be used.

(c) Crude oil and crankcase oil shall not be used because they may contain light ends that offer increased vapor-explosion hazards or gritty particles that tend to sensitize the resulting blasting agent.

(d) If solid fuels are used, they shall be chosen so as to minimize dust-explosion hazard.

(e) Metal dust (aluminum powder, etc.) peroxides, chlorates, or perchlorates shall not be used unless such operations are conducted in a manner approved by the state fire marshal.

(f) Unusual compositions shall not be attempted except under the supervision of competent personnel equipped to determine the over-all hazard of the resulting compositions.

(g) Suitable means shall be provided to prevent the flow of fuel oil to the mixer in case of fire. In gravity flow systems an automatic spring-loaded shutoff valve with fusible link shall be installed.

(Effective April 18, 1972)

29-349-267. Power sources for mixing plants

(a) All electrical switches, controls, motors, and lights, if located in the mixing rooms shall conform to the requirements of Class II, Division 2 of the National Electricl Code; otherwise they should be located outside the mixing room. The frame of the mixer and all other equipment that may be used shall be electrically bonded and provided with a continuous path to the ground.

(b) All internal-combustion engines used for electric power generation shall be located outside the mixing plant building or shall be properly ventilated and isolated by a fire wall. The exhaust systems on all such engines shall be located so any spark emission can not be a hazard to any materials in or adjacent to the plant.

(Effective April 18, 1972)

Sec. 29-349-268. Washdown facilities

An automatic water-deluge system with adequate capacity shall

be provided to protect mixers and the finished explosives storage area in permanently located plants. Floors shall be constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in case of fire. The floors and equipment of the mixing and packaging room shall be washed down frequently to prevent accumulation of oxidizers or fuels and other sensitizers. The entire mixing and packaging plant shall be washed down periodically to prevent excessive accumulation of dust.

(Effective April 18, 1972)

Sec. 29-349-269. Smoking prohibited

Smoking or open flames shall not be permitted in or within 50 feet of any building or facility used for the mixing of blasting agents.

(Effective April 18, 1972)

Sec. 29-349-270. Disposal of nitrate bags

Empty ammonium nitrate bags shall be disposed of daily by burning in small quantities in safe location. No person shall remain within 100 feet once the burning has started.

(Effective April 18, 1972)

Sec. 29-349-271. Limited production

Not more than one day's production of blasting agents or the limit determined by the American Table of Distances, whichever is less, shall be permitted in or near the mixing and packaging plant or area. Larger quantities shall be stored in separate warehouses or magazines.

(Effective April 18, 1972)

Sec. 29-349-272. Storage of blasting agents and supplies

Blasting agents, ammonium nitrate and all oxidizers used for mixing of blasting agents shall be stored in the manner set forth in this section.

(a) Blasting agents or ammonium nitrate, when stored in conjunction with explosives shall be stored in conformity with the Table of Distances Chart, Chapter IX of this Code. The mass of blasting agents and one-half the mass of ammonium nitrate shall be included when computing the total quantity of explosives for determining distance requirements.

(b) Blasting agents when stored entirely separate may be stored in the manner set forth for Class A explosives or in one-story warehouses (without basements) which shall be:

1. Noncombustible or fire-resistive;
2. Constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in in case of fire;
3. Weather resistant;
4. Well ventilated; and
5. Equipped with a strong door kept securely locked, in the same manner as explosives magazines, except when open for business under supervision.

(c) Semi-trailer or full trailer vans used for highway or on-site transportation of the blasting agents are satisfactory for temporary storing of these materials, provided they are located according to the American Table of Distances with respect to inhabited buildings, passenger railroads and public highways and according to the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents with respect to one another. Trailers shall be provided with substantial means for locking and the trailer doors shall be kept locked, except during the time of placement and removal of stocks and blasting agents.
(Effective April 18, 1972)

Sec. 29-349-273. Blasting agents stored in warehouses

Warehouses used for the storage of blasting agents separate from explosives shall be located as set forth in this section:
(a) Warehouses used for the storage of blasting agents shall be located in accordance with the provisions of the American Table of Distances with respect to inhabited buildings, passenger railroads, public highways and according to the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents with respect to one another.
(b) If both blasting agents and ammonium nitrate are handled or stored within the distance limitations prescribed in the Table of Distance chart of this code, one-half the mass of ammonium nitrate shall be added to the mass of the blasting agent when computing the total quantity of explosives for determining the proper distance for compliance with the American Table of Distances.
(Effective April 18, 1972)

Sec. 29-349-274. Smoking, firearms, etc. prohibited locations

Smoking, matches, open flames, spark producing devices and firearms shall be prohibited inside of or within 50 feet of any mixing and packaging plant or area of any warehouse used for the storage of blasting agents. Combustible materials, shall not be

stored within 50 feet of mixing plants or warehouses used for the storage of blasting agents and the land surrounding such places shall be maintained clear of dried grass, leaves and brush for this distance.
(Effective April 18, 1972)

29-349-275. Warehouse housekeeping

The interior of warehouses used for the storage of blasting agents shall be kept clean and free from debris and empty containers. Spilled materials shall be cleaned up promptly and safely removed. Combustible materials, flammable liquids, corrosive acids shall not be stored in any warehouse used for blasting agents unless separated therefrom by a fire-resistive separation of not less than one hour resistance. The provisions of this section shall not prohibit the storage of blasting agents with non-explosive blasting supplies.
(Effective April 18, 1972)

Sec. 29-349-276. Fuels to be separated

Piles of ammonium nitrate and warehouses containing ammonium nitrate shall be adequately separated from readily combustible fuels.
(Effective April 18, 1972)

Sec. 29-349-277. Loosening materials by blasting prohibited

Caked ammonium nitrates either in bags or in bulk, shall not be loosened by blasting.
(Effective April 18, 1972)

Sec. 29-349-278. Warehouses to be supervised by competent person

Every warehouse used for the storage of blasting agents shall be under the supervision of a competent person who shall be not less than 21 years of age.
(Effective April 18, 1972)

29-349-279. Authority to designate location and quantity of blasting agents

The state fire marshal has the authority to and may designate the location for, and limit the quantity of blasting agents which may be loaded, unloaded, reloaded or temporarily retained at any facility within the state.
(Effective April 18, 1972)

Sec. 29-349-280. Transportation of blasting agents

When blasting agents are transported all of the requirements of these regulations concerning the transportation of explosives shall be complied with, and vehicles involved shall be placarded and marked in the same manner as explosives vehicles.
(Effective April 18, 1972)

Sec. 29-349-281. Operators of vehicles transporting blasting agents

Vehicles transporting blasting agents shall only be driven by and be in charge of a licensed driver who is physically fit, careful, capable, reliable, able to read and write the English language proficiently, and not addicted to the use, or under the influence of intoxicants, narcotics, or drugs, and not less than 21 years of age. He shall be familiar with the traffic regulations, state laws, and the provisions of these regulations.
(Effective April 18, 1972)

29-349-282. Certain substances prohibited

No sparking metal, sparking metal tools, oils, matches, firearms, spark producing devices, acids or other corrosive liquids shall be carried in the bed or body of any vehicles containing blasting agents.
(Effective April 18, 1972)

Sec. 29-349-283. Use of intoxicating liquor prohibited

No person shall be permitted to ride upon, drive, load or unload a vehicle containing blasting agents while smoking or under the influence of intoxicants or drugs.
(Effective April 18, 1972)

29-349-284. Transportation on public vehicles prohibited

It is prohibited for any person to transport or carry any blasting agents upon any public vehicle carrying passengers for hire.
(Effective April 18, 1972)

29-349-285. Condition of vehicle

Vehicles transporting blasting agents shall be in a safe operating condition at all times.
(Effective April 18, 1972)

Sec. 29-349-286. Packaging and marking of containers

When offering blasting agents for transportation on public

highways, the packaging, marking and labeling of explosives & blasting agents shall comply with the requirements of the U.S Department of Transportation.

(a) Vehicles used for transporting blasting agents on public highways shall be placarded in accordance with the U.S. Department of Transportation regulations.

(Effective April 18, 1972)

Sec. 29-349-287. Bulk delivery and mixing vehicle of blasting agents

Regulations of the section shall apply to off-highway private operation as well as to all public highway transportation.

(a) A bulk vehicle body shall be constructed of noncombustible materials.

(b) Vehicles used to transport bulk pre-mixed blasting agents on public highway shall have closed bodies.

(c) All moving parts of the mixing system shall be designed as to prevent a heat build-up. Shafts or axles which contact the product shall have outboard bearing with 1 inch minimum clearance between the bearing and outside of the product container. Particular attention shall be given to the clearance on all moving parts.

(d) A bulk delivery vehicle shall be strong enough to carry the load without difficulty and be in good mechanical condition.

(e) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying and related equipment, and also be familiar with commodities being delivered and procedure used in emergency situations.

(f) Caution shall be exercised in the movement of the vehicle in the blasting area to avoid driving the vehicle over or dragging hoses over firing lines, cap wires, or explosive materials. The employer shall provide a second person to guide his movements.

(g) No intransit mixing of materials shall be performed.

(h) No repairs to bulk delivery or mixing vehicles shall be made unless it has been completely washed down and all oxidizer material removed.

(i) When electric power is supplied by a self-contained motor generator located on the vehicle the generator shall be at a point separate from where the blasting agent is discharged.

(j) The location chosen for the blasting agent transfer from a support vehicle into the borehole loading vehicle shall be away from the blast hole site when the boreholes are loaded or in the process of being loaded.

(k) A positive action parking brake will set the wheel brakes on at least one axle shall be provided on vehicles when equipped with air brakes and shall be used during bulk delivery operations. Wheel chocks shall supplement parking brakes.

(Effective April 18, 1972)

29-349-288. Use of blasting agents

Persons using blasting agents shall comply with all the applicable provisions of these regulations concerning the use of explosives and as set forth in this section.

(a) Pneumatic loading from bulk delivery vehicles into boreholes primed with electric blasting caps or other static-sensitive systems shall meet the following requirements:

(1) A positive grounding device shall be used to prevent accumulation of static electricity.

(2) A discharge hose shall be used that has a resistance range that will prevent conducting stray currents, but that is conductive enough to bleed off static building.

(Effective April 18, 1972)

## CHAPTER IX. STORAGE OF AMMONIUM NITRATE

29-349-289. General application

These regulations apply to the storage of ammonium nitrate in the form of crystals, flakes, grains or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade and other mixtures containing 60 per cent or more ammonium nitrate by weight, but does not apply to blasting agents.

(Effective April 18, 1972)

29-349-290. Prohibited storage

The storage of ammonium nitrate that does not meet the specifications of fertilizer grade ammonium nitrate as set forth by the state fire marshal shall not be permitted by these regulations except on the specific approval of said marshal.

(Effective April 18, 1972)

29-349-291. Regulations application

These regulations shall apply to all persons, firms, corporations, co-partnerships and associations storing, having or keeping ammonium nitrate, and to the owner or lessee of any building, premises or structure in which ammonium nitrate is stored in quantities of 1,000 pounds or more.

(Effective April 18, 1972)

29-349-292. Maximum storage

Not more than 60 tons of ammonium nitrate shall be stored unless the location and storage facility have been approved.

(Effective April 18, 1972)

Sec. 29-349-293. Approval of storage location

Storage locations shall be subject to the approval by the state fire marshal with respect to nearness of residential occupancies, places of public assembly, schools, hospitals, railroads and public highways. Limitations on storable quantities shall be considered with regard to proximity of these exposures and congested commercial or industrial districts.
(Effective April 18, 1972)

29-349-294. Approval of large quantity storage

Approval of large quantity storage shall be subject to due consideration of possible toxic vapors from burning or decomposing ammonium nitrate.
(Effective April 18, 1972)

Sec. 29-349-295. Storage building requirements

Storage buildings shall not be over one story in height or have basements, unless approved for such use, and shall be equipped with lightning rod protection.
(Effective April 18, 1972)

29-349-296. Ventilation

Storage buildings shall have adequate ventilation or be of a construction that will be self-ventilating in the event of fire.
(Effective April 18, 1972)

Sec. 29-349-297. Walls exposed to combustible buildings. Protection

The wall on the exposed side of a storage building within 50 feet of a combustible building, forest, piles of combustible materials and similar exposure hazards shall be of fire resistive or noncombustible construction. In lieu of the fire-resistive or noncombustible wall, other better means of exposure protection such as outside automatic sprinklers or free standing walls may be used. The roof coverings shall be Class C or better, as defined in Roof Coverings, NFPA No. 203.

Sec. 29-349-298. Floor construction

All flooring in storage and handling areas shall be of noncombustible material or protected against impregnation by ammonium nitrate and shall be without open drains, traps, tunnels, pits or pockets into which any molten ammonium nitrate could flow and be confined in the event of fire.
(Effective April 18, 1972)

29-349-299. Existing storage buildings

The continued use of an existing storage building or structure not in strict conformity with these regulations may be approved in cases where such continued use will not constitute a hazard to life or adjoining property.
(Effective April 18, 1972)

Sec. 29-349-300. Buildings to be dry

Buildings and structures shall be dry and free from water seepage through the roof, walls and floor.
(Effective April 18, 1972)

Sec. 29-349-301. Bags and container requirements

Bags and containers used for ammonium nitrate must comply with specifications and standards required for use in interstate commerce.
(Effective April 18, 1972)

29-349-302. Containers requirement exemption

Containers used on the premises in the actual manufacturing or processing need not comply with provisions of Section 29-349-301.
(Effective April 18, 1972)

29-349-303. Maximum temperature for storage

Containers of ammonium nitrate shall not be accepted for storage when the temperature of the ammonium nitrate exceeds 130 degrees F.
(Effective April 18, 1972)

Sec. 29-349-304. Ammonium nitrate storage height limitation

Bags of ammonium nitrate shall not be stored within 30 inches of the storage building walls land partitions.
(Effective April 18, 1972)

Sec. 29-349-305. Pile storage requirements

The height of piles shall not exceed 20 feet. The width of piles shall not exceed 20 feet and the length 50 feet except that where the building is of noncombustible construction or is protected by automatic sprinklers the length of piles shall not be limited. In no case shall the ammonium nitrate to stacked closer than 36 inches below the roof or supporting and spreader beams overhead.
(Effective April 18, 1972)

Aisles shall be provided to separate piles by a clear space of not less than 3 feet in width. At least one service or main aisle in the storage shall be not less than 4 feet in width.
(Effective April 18, 1972)

Sec. 29-349-307. Waiver for pile sizes

The requirements for pile sizes and aisles, as set forth in Sections 29-349-305 and 29-349-306 may be waived by the state fire marshal where storage facilities are located in remote areas.
(Effective April 18, 1972)

29-349-308. Bulk storage by specific approval

Bulk storage of ammonium nitrate shall be permitted only after specific approval by the local or state fire marshal, who shall give due consideration to the location in regard to heavily populated and built up centers.
(Effective April 18, 1972)

29-349-309. Permissible bulk storage

Bulk storage may be in covered open piles, in bins, in warehouses, or in silo-type structures and shall totally exclude all other commodoties of an organic, combustible or oxidizable nature.
(Effective April 18, 1972)

Sec. 29-349-310. Warehouse ventilation. Combustible construction

Warehouses, if of combustible construction, shall have adequate ventilation or be capable of adequate ventilation in case of fire.
(Effective April 18, 1972)

29-349-311. Maximum height requirements

Unless constructed of noncombustible material, bulk storage structures shall not exceed a height of 40 feet.
(Effective April 18, 1972)

29-349-312. Bin contamination

Bins shall be clear and free of materials which may contaminate ammonium nitrate.
(Effective April 18, 1972)

29-349-313. Prohibited bin construction materials

Due to corrosive and reactive properties of ammonium nitrate, and to avoid contamination, steel, galvanized iron, copper, lead and zinc shall not be used in bin construction unless suitable protected.
(Effective April 18, 1972)

Sec. 29-349-314. Warehouse subdivision

The warehouse may be subdivided by tight partition walls into any desired number of ammonium nitrate storage compartments or bins.
(Effective April 18, 1972)

29-349-315. Identification signs

The ammonium nitrate storage bins or piles shall be clearly identified by signs reading "AMMONIUM NITRATE" with letters at least 2 inches high.
(Effective April 18, 1972)

29-349-316. Periodic moving of material

Piles or bins shall be so sized and arranged that all material in the pile is moved out periodically in order to minimize possible caking of the stored ammonium nitrate.

29-349-317. Limitations of depth of piles

Height or depth of piles shall be limited by the pressure setting tendency of the product. However, in no case shall the ammonium nitrate be piled higher at any point than 36 inches below the roof or supporting and spreader beams overhead.

Sec. 29-349-318. Maximum temperature for storage

Ammonium nitrate shall not be accepted for storage when the temperature of the product exceeds 130 degrees F.
(Effective April 18, 1972)

Sec. 29-349-319. Use of explosives prohibited for loosening

Dynamite, other explosives, and blasting agents shall not be used to break up or loosen caked ammonium nitrate.
(Effective April 18, 1972)

Sec. 29-349-320. Wall construction requirements for separation

Ammonium nitrate shall be separated by approved type walls of not less than one hour fire-resistance rating from storage or organic chemicals, acids or corrosive liquids, or other contaminating substances including but not limited to animal fats, baled cotton, baled rags, baled scrap paper, bleaching powder, burlap or cotton bags, caustic soda, coal, coke, charcoal, cork, camphor, excelsior, fibers of any kinds, fish oils, fish meal, foam rubber, hay, lubricating oil, linseed oil, or other oxidizable or drying oils, napthalene, oakum, oiled clothing, oiled paper, oiled textiles, paint, straw, sawdust, wood shavings, or vegetable oils. Walls referred to in this section need extend only to the underside of the roof.
(Effective April 18, 1972)

Sec. 29-349-321. Separation requirements with outwalls

In lieu of separation walls, ammonium nitrate may be separate from the materials referred to in the foregoing section by a space at least 30 feet or more as required by the local or state fire marshal, and if necessary, sill or curbs shall be provided to prevent mixing during fire conditions.
(Effective April 18, 1972)

Sec. 29-349-322. Flammable liquid storage prohibited

Flammable liquids such as gasoline, kerosene, solvents and light fuel oils shall not be stored on the premises except as approved by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-323. LP-Gas storage prohibited

LP-Gas shall not be stored on the premises except as approved by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-324. Other materials storage restricted

Sulphur and finely-divided metals shall not be stored in the same building with ammonium nitrate except as approved by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-325. Prohibited storage of explosives and blasting agents.

(a) Explosives and blasting agents shall not be stored in the same building with ammonium nitrate except on the premises of makers, distributors and user-compounders of explosives or

blasting agents.

(b) When explosives or blasting agents are stored in separate buildings, other than on the premises of makers, distributors, and user-compounders of explosives, or blasting agents, they shall be separated from the ammonium nitrate by the distances and/or barricades specified in the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents, but by not less than 50 feet.

(c) Storage and/or operations on the premises of makers, distributors and user-compounders of explosives or blasting agents shall be in conformity with this Code.

(Effective April 18, 1972)

Sec. 29-349-326. Electrical installations

Electrical installations shall conform to the requirements of the National Electric Code. They shall be designed to minimize damage from corrosion.

(Effective April 18, 1972)

29-349-327. Electric light protection

Electric lamps shall be located or guarded so as to preclude contact with bags or other combustible materials.

(Effective April 18, 1972)

29-349-328. Housekeeping

Good housekeeping shall be maintained.

(Effective April 18, 1972)

Sec. 29-349-329. Broken bag content salvage

Uncontaminated contents or broken bags may be salvaged by placing the damaged bag inside a clean, new slip-over bag and closing securely. Other spilled materials and discarded containers shall be promptly gathered and disposed of in a safe manner.

(Effective April 18, 1972)

Sec. 29-349-330. Open lights or flames and smoking prohibited

Open lights or flames and smoking shall be prohibited in storage buildings, but this is not meant to exclude heating units approved by the state fire marshal.

(Effective April 18, 1972)

29-349-331. Entrances to warehouses to be properly identified

All points of entry to commercial warehouses in which ammonium nitrate is stored shall be properly identified with durable signs meeting the following specifications:

(a) Signs shall have background and letters in contrasting colors.

(b) Signs shall be worded "AMMONIUM NITRATE", with letters at least 2 inches high.

(Effective April 18, 1972)

29-349-332. Vehicle parking in buildings restricted

Internal combustion motor vehicles, lift trucks and cargo conveyors shall not be permitted to remain overnight in a building where ammonium nitrate is stored unless parked in an area approved exclusively for such parking purposes.

(Effective April 18, 1972)

29-349-333. Trucks inside warehouses to conform to requirements

Fork trucks, tractors, platform lift trucks, and other specialized industrial trucks used within the warehouse shall conform to the requirements of the state fire marshal.

(Effective April 18, 1972)

Sec. 29-349-334. Lightning protection

In areas where lightning storms are prevalent, lightning protection shall be provided. See the Lightning Protection Code, NFPA No. 78.

(Effective April 18, 1972)

Sec. 29-349-335. Unauthorized personnel

Provisions shall be made to prevent unauthorized personnel from entering the ammonium nitrate storage area.

(Effective April 18, 1972)

Sec. 29-349-336. Automatic sprinkler requirements

Unless the storage of a greater quantity is approved by the state fire marshal, not more than 2,500 tons of bagged ammonium nitrate shall be stored in a building or structure not equipped with an automatic sprinkler system suitable for high hazard occupancies. When determining whether greater quantities shall be permitted without sprinkler protection, the state fire marshal shall take into consideration proximity of the storage building to built-up areas, possible presence of contaminates in the storage building, and the availability of water supplies.

Sprinkler protection may be required for the storage of less than 2,500 tons of ammonium nitrate where location of the building or the presence of other stored materials may present a special hazard.
(Effective April 18, 1972)

Sec. 29-349-337. Automatic sprinkler installation

Sprinkler systems shall be approved type and installed in accordance with the requirements of the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-338. Portable fire extinguishers

Suitable fire control devices such as small hose or portable extinguishers shall be provided throughout the warehouse and in the loading and unloading areas as required by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-339. Fire hydrants

Water supplies and fire hydrants shall be available in accordance with recognized good practices and as required by the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-340. Sprinklers, hydrants may be waived

The requirements for automatic sprinklers, water supplies and fire hydrants set forth in this Code may be waived by the state fire marshal when storage facilities are located in remote areas.

Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents (Notes 1,6)**

| Donor Weight | | Minimum Separation Distance of Receptor When Barricaded (Note 2) (Feet) | | Minimum Thickness of Artificial Barricades (Note 5) (Inches) |
|---|---|---|---|---|
| Pounds over | Pounds not over | Ammonium Nitrate | Blasting Agent | |
| | 100 | 3 | 11 | 12 |

| Pounds over | Pounds not over | Ammonium Nitrate | Blasting Agent | |
|---|---|---|---|---|
| 100 | 300 | 4 | 14 | 12 |
| 300 | 600 | 5 | 18 | 12 |
| 600 | 1,000 | 6 | 22 | 12 |
| 1,000 | 1,600 | 7 | 25 | 12 |
| 1,600 | 2,000 | 8 | 29 | 12 |
| 2,000 | 3,000 | 9 | 32 | 15 |
| 3,000 | 4,000 | 10 | 36 | 15 |
| 4,000 | 6,000 | 11 | 40 | 15 |
| 6,000 | 8,000 | 12 | 43 | 20 |
| 8,000 | 10,000 | 13 | 47 | 20 |
| 10,000 | 12,000 | 14 | 50 | 20 |
| 12,000 | 16,000 | 15 | 54 | 25 |
| 16,000 | 20,000 | 16 | 58 | 25 |
| 20,000 | 25,000 | 18 | 65 | 25 |
| 25,000 | 30,000 | 19 | 68 | 30 |
| 30,000 | 35,000 | 20 | 72 | 30 |
| 35,000 | 40,000 | 21 | 76 | 30 |
| 40,000 | 45,000 | 22 | 79 | 35 |
| 45,000 | 50,000 | 23 | 83 | 35 |
| 50,000 | 55,000 | 24 | 86 | 35 |
| 55,000 | 60,000 | 25 | 90 | 35 |
| 60,000 | 70,000 | 26 | 94 | 40 |
| 70,000 | 80,000 | 28 | 101 | 40 |
| 80,000 | 90,000 | 30 | 108 | 40 |
| 90,000 | 100,000 | 32 | 115 | 40 |
| 100,000 | 120,000 | 34 | 122 | 50 |
| 120,000 | 140,000 | 37 | 133 | 50 |
| 140,000 | 160,000 | 40 | 144 | 50 |
| 160,000 | 180,000 | 44 | 158 | 50 |
| 180,000 | 200,000 | 48 | 173 | 50 |
| 200,000 | 220,000 | 52 | 187 | 60 |
| 220,000 | 250,000 | 56 | 202 | 60 |
| 250,000 | 275,000 | 60 | 216 | 60 |
| 275,000 | 300,000 | 64 | 230 | 60 |

**This Table appears in Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents, adopted as an NFPA Tentative Standard (No. 492-T) in 1967. For a discussion of the derivation of the Table and examples of how it is applied to actual storage situations, see No. 492-T.

NFPA 495 46 NOTE A46 New reference replaced reference to tentative recommendations in Information Circular 7988. New is as follows: "Safety Recommendation for Sensitized Ammonium Nitrate Blasting Agents", Bureau of Mines, U.S. Department of Interior, Information Circular 8179, 1963.

## NOTES TO TABLE OF RECOMMENDED SEPARATION AMMONIUM NITRATE AND BLASTING AGENTS FROM EXPLOSIVES OR BLASTING AGENTS

Note 1 - Recommended separation distances to prevent explosion of ammonium nitrate and ammonium nitrate based blasting agents by propagation from nearby stores of high explosive or blasting agents referred to in the Table as the "donor". Ammonium nitrate, by itself, is not considered to be a donor when applying this Table. If stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, one-half the mass of the ammonium nitrate should be included in the mass of the donor. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like, which may enclose the "donor". These distances apply to the separation of stores only. The American Table of Distances shall be used in determining separation distances from inhabited buildings, passenger railways, and public highways.

Note 2 - When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the Table shall be multiplied by six. Where storage is in bullet-resistant magazines* recommended for explosives, or where the storage is protected by a bullet resistant wall, distances and barricade thickness in excess of those prescribed in the American Table of Distances are not required.

Note 3 - The distances in the Table apply to ammonium nitrate that passes the insensitivity test prescribed in the National Plant Food Institute; ** and ammonium nitrate failing to pass said test shall be stored at separation distances determined by competent persons and approved by the state fire marshal's office.

Note 4 - These di s apply to nitrc carbo-nitrates blasting agents which pass the insensitivity test prescribed the DOT regulations.

---

* For construction of bullet-resistant magazines, see Chapter 3, NFPA 1967-68.

**Definition and Test Procedures of Ammonium Nitrate Fertilizer, National Plant Food Institute, November 1964.

Note 5 - Earth or sand dikes or enclosures filled with the prescribed minimum thickness of earth or sand are acceptable artificial barricades. Natural barricades, such as hills or timber of sufficient density that the surroundings exposures which require protection cannot be seen from the "donor" when the trees are bare of leaves, are also acceptable.

Note 6 - When the ammonium nitrate must be counted in determining the distances to be maintained from inhabited buildings, passenger railways and public highways, it may be counted at one-half its actual weight.

(Effective April 18, 1972)

## CHAPTER X. PROTECTION OF STORED EXPLOSIVES

### Sec. 29-349-341. American Table of Distances

The following is the American Table of Distances for Storage of Explosives.

American Table of Distances for Storage of Explosives

| Explosives | | Distance in Feet When Storage is Barricaded | | | |
|---|---|---|---|---|---|
| Pounds over | Pounds not over | Inhabited buildings | Passenger railways | Public highways | Separation of mags. |
| 2 | 5 | 70 | 30 | 30 | 6 |
| 5 | 10 | 90 | 30 | 30 | 8 |
| 10 | 20 | 110 | 45 | 45 | 10 |
| 20 | 30 | 125 | 50 | 50 | 11 |
| 30 | 40 | 140 | 55 | 55 | 12 |
| 40 | 50 | 150 | 60 | 60 | 14 |

| Pounds over | Pounds not over | Inhabited buildings | Passenger railways | Public highways | Separation of mags. |
|---|---|---|---|---|---|
| 50 | 75 | 170 | 70 | 70 | 15 |
| 75 | 100 | 190 | 75 | 75 | 16 |
| 100 | 125 | 200 | 80 | 80 | 18 |
| 125 | 150 | 215 | 85 | 85 | 19 |
| 150 | 200 | 235 | 95 | 95 | 21 |
| 200 | 250 | 255 | 105 | 105 | 23 |
| 250 | 300 | 270 | 110 | 110 | 24 |
| 300 | 400 | 295 | 120 | 120 | 27 |
| 400 | 500 | 320 | 130 | 130 | 29 |
| 500 | 600 | 340 | 135 | 135 | 31 |
| 600 | 700 | 355 | 145 | 145 | 32 |
| 700 | 800 | 375 | 150 | 150 | 33 |
| 800 | 900 | 390 | 155 | 155 | 35 |
| 900 | 1,000 | 400 | 160 | 160 | 36 |
| 1,000 | 1,200 | 425 | 170 | 165 | 39 |
| 1,200 | 1,400 | 450 | 180 | 170 | 41 |
| 1,400 | 1,600 | 470 | 190 | 175 | 43 |
| 1,600 | 1,800 | 490 | 195 | 180 | 44 |
| 1,800 | 2,000 | 505 | 205 | 185 | 45 |
| 2,000 | 2,500 | 545 | 220 | 190 | 49 |
| 2,500 | 3,000 | 580 | 235 | 195 | 52 |
| 3,000 | 4,000 | 635 | 255 | 210 | 58 |
| 4,000 | 5,000 | 685 | 275 | 225 | 61 |
| 5,000 | 6,000 | 730 | 295 | 235 | 65 |
| 6,000 | 7,000 | 770 | 310 | 245 | 68 |
| 7,000 | 8,000 | 800 | 320 | 250 | 72 |
| 8,000 | 9,000 | 835 | 335 | 255 | 75 |
| 9,000 | 10,000 | 865 | 345 | 260 | 78 |
| 10,000 | 12,000 | 875 | 370 | 270 | 82 |
| 12,000 | 14,000 | 885 | 390 | 275 | 87 |
| 14,000 | 16,000 | 900 | 405 | 280 | 90 |
| 16,000 | 18,000 | 940 | 420 | 285 | 94 |
| 18,000 | 20,000 | 975 | 435 | 290 | 98 |
| 20,000 | 25,000 | 1,055 | 470 | 315 | 105 |
| 25,000 | 30,000 | 1,130 | 500 | 340 | 112 |
| 30,000 | 35,000 | 1,205 | 525 | 360 | 119 |

| Pounds over | Pounds not over | Inhabited buildings | Passenger railways | Public highways | Separation of mags. |
|---|---|---|---|---|---|
| 50,000 | 55,000 | 1,460 | 610 | 440 | 140 |
| 55,000 | 60,000 | 1,515 | 630 | 455 | 145 |
| 60,000 | 65,000 | 1,565 | 645 | 470 | 150 |
| 65,000 | 70,000 | 1,610 | 660 | 485 | 155 |
| 70,000 | 75,000 | 1,655 | 675 | 500 | 160 |
| 75,000 | 80,000 | 1,695 | 690 | 510 | 165 |
| 80,000 | 85,000 | 1,730 | 705 | 520 | 170 |
| 85,000 | 90,000 | 1,760 | 720 | 530 | 175 |
| 90,000 | 95,000 | 1,790 | 730 | 540 | 180 |
| 95,000 | 100,000 | 1,815 | 745 | 545 | 185 |
| 100,000 | 110,000 | 1,835 | 770 | 550 | 195 |
| 110,000 | 120,000 | 1,855 | 790 | 555 | 205 |
| 120,000 | 130,000 | 1,875 | 810 | 560 | 215 |
| 130,000 | 140,000 | 1,890 | 835 | 565 | 225 |
| 140,000 | 150,000 | 1,900 | 850 | 570 | 235 |
| 150,000 | 160,000 | 1,935 | 870 | 580 | 245 |
| 160,000 | 170,000 | 1,965 | 890 | 590 | 255 |
| 170,000 | 180,000 | 1,990 | 905 | 600 | 265 |
| 180,000 | 190,000 | 2,010 | 920 | 605 | 275 |
| 190,000 | 200,000 | 2,030 | 935 | 610 | 285 |
| 200,000 | 210,000 | 2,055 | 955 | 620 | 295 |
| 210,000 | 230,000 | 2,100 | 980 | 635 | 315 |
| 230,000 | 250,000 | 2,155 | 1,010 | 650 | 335 |
| 250,000 | 275,000 | 2,215 | 1,040 | 670 | 360 |
| 275,000 | 300,000 | 2,275 | 1,075 | 690 | 385 |

(Effective April 18, 1982)

29-349-342. Existing Class B magazines

Magazines constructed and licensed prior to September 1, 1964 and used exclusively for the storage of Class B explosives may be located at one-half the distance specified in the table.
(Effective April 18, 1972)

Sec. 29-349-343. Non-barricaded magazines.

When a building containing explosives is not barricaded, the distance shown in the table shall be doubled.
(Effective April 18, 1972)

29-349-344. Requirements for two or more magazines on same property.

When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways and highways, and in addition, they should be separated from each other by not less than the distances shown for "Separation of Magazines" except that the quantity of explosives contained in cap magazines shall govern in regard to the spacing of said cap magazines from magazines containing other explosives. If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group must be considered as one magazine, and the total quantity of explosives stored in each group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum distances specified from other magazines, inhabited buildings, railways and highways.
(Effective April 18, 1972)

Sec. 29-349-345. Storage of explosives exceeding 300,000 pounds.

The permanent storage of more than 300,000 pounds of commercial explosives in one magazine or in a group of magazines which is considered as one magazine is not permitted except by the specific approval of the state fire marshal.
(Effective April 18, 1972)

Sec. 29-349-346. Explosive rating of blasting caps

All types of blasting caps in strength through No. 8 shall be rated at 1 1/2 pounds of explosives per 1,000 caps. The state fire marshal shall designate the ratings of caps higher in strength than No. 8.
(Effective April 18, 1972)

## CHAPTER XI. WATER GELS OR SLURRY EXPLOSIVES**

Sec. 29-349-347. General provision

Unless otherwise set forth in this chapter, water gels shall be transported, stored and used in the same manner as explosives or blasting agents in accordance with the classification of the product.
(Effective April 18, 1972)

Sec. 29-349-348. Premixed water gels

Premixed water gels containing a substance in itself classified

---

**Chapter 9, NFPA 1968-68

as specified for explosives in this Code.
(Effective April 18, 1972)

Sec. 29-349-349. Cap-sensitive premixed water gels

Premixed water gels containing no substance in itself classified as an explosive and which are cap-sensitive as defined in Section 29-349-106 of this Code under Blasting Agent shall be classified as an explosive and manufactured, transported, stored, and used as specified for explosives in this Code.
(Effective April 18, 1972)

Sec. 29-349-350. Non cap sensitive premixed water gels

Premixed water gels containing no substance in itself classified as an explosive and which are NOT cap-sensitive as defined in Section 29-349-106 of this Code under Blasting Agent shall be classified as blasting agents and manufactured, transported, stored, and used as specified for blasting agents in this Code.
(Effective April 18, 1972)

Sec. 29-349-351. On-site-mixed water gels

Ingredients for on-site-mixed water gels shall be stored as set forth in this section.
(a) Ingredients in themselves classified as Class A or Class B explosives shall be stored in conformity with Chapter IV of this Code.
(b) Ingredient, other than ammonium nitrate, not in themselves classified as explosives, shall be stored in warehouses which shall be noncombustible or fire resistive.
(c) Prilled, grained, or granulated ammonium nitrate shall be stored in accordance with Chapter IX, Code for the Storage of Ammonium Nitrate. If ammonium nitrate is stored in the vicinity of explosives or blasting agents, the separation distances specified in the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives shall be observed.
(d) Liquid ammonium nitrate solutions shall be stored in tank cars, tank trucks, or permanent tanks in a location approved by the authority having jurisdiction. Spills or leaks which may contaminate combustible materials shall be cleaned up immediately.
(Effective April 18, 1972)

Sec. 29-349-352. Electric power sources

If electric power is used it may be furnished by cable from an outside source or by a self-contained motor generator. In the case of a self-contained power source, it shall be located at the end of the storage container opposite that at which the blasting agent is discharged. It shall have adequate capacity for the loads to be expected and be equipped with suitable overload protection devices.
(Effective April 18, 1972)

29-349-353. Electric wiring requirements

Electric wiring carrying voltages greater than 21 volts shall be armored or in conduit and, if dry ingredients are employed, the wiring shall conform to the requirements of Class II, Division 2 of the National Electrical Code NFPA No. 70. The materials protecting the electric wiring must be of such composition that they will not be chemically attacked by the ingredients being processed.
(Effective April 18, 1972)

29-349-354. Mixing equipment requirements

Mixing equipment for on-site-mixed water gels shall comply with the requirements of this section.
(a) All electric motors, electrically operated proportioning devices, etc., shall be electrically bonded.
(b) All electric motors, electrically operated proportioning devices, etc., used for dry ingredients shall conform to the requirements of Class II, Division 2 of the National Electrical Code, NFPA No.70.
(c) The entire loading and mixing equipment shall be cleaned periodically to insure against accumulations of ingredients.
(Effective April 18, 1972)

## CHAPTER XII. SMALL ARMS AMMUNITION, SMALL ARMS PRIMERS AND SMOKELESS PROPELLANTS

Sec. 29-349-355. General provisions

In addition to all other applicable requirements in this Code the intrastate transportation of small arms ammunition, small arms ammunition primers and smokeless propellants shall be in accordance with current U.S. Department of Transportation regulations.
(Effective April 18, 1972)

Sec. 29-349-356. Chapter provisions that do not apply

provisions of this chapter do not apply in process storage

and intra-plant transportation during manufacture of small ammunition, small arms primers, and smokeless propellants.
(Effective April 18, 1972)

29-349-357. Small arms ammunition

No restrictions are imposed on truck or rail transportation of small arms ammunition other than those which are imposed by the U.S. Department of Transportation or by the presence of other hazardous material.
(Effective April 18, 1972)

29-349-358. Small arms ammunition warehouse storage unlimited

No quantity limitations shall be imposed on storage of small arms ammunition in warehouses, retail stores and other general occupancies, except those imposed by limitations of storage facilities and consistency with public safety..
(Effective April 18, 1972)

Sec. 29-349-359. Separation from flammables

Small arms ammunition shall be separated from flammable liquids, flammable solids (as classified by the U.S. Department of Transportation), and oxidizing materials by a fire-resistive wall of one-hour rating or by a distance of 25 feet.
(Effective April 18, 1972)

Sec. 29-349-360. Storage with Class A or Class B explosives prohibited

Small arms ammunition shall not be stored together with Class A or Class B explosives (as defined by U.S. Department of Transportation regulations) unless the storage facility is adequate for this later storage.
(Effective April 18, 1972)

Sec. 29-349-361. Smokeless propellants

Quantities of smokeless propellants in shipping containers approved by the U.S. Department of Transportation not in excess of 50 pounds may be transported in a passenger vehicle.
(Effective April 18, 1972)

29-349-362. Limits for transportation in passenger vehicles

Quantities in excess of 25 pounds but not exceeding 50 pounds in a passenger vehicle shall be transported in a portable

magazine having wooden walls of at least 1 inch nominal thickness.
(Effective April 18, 1972)

Sec. 29-349-363. Transportation in passenger vehicles of quantities in excess of 50 pounds. Prohibited

Transportation of quantities in excess of 50 pounds is prohibited in passenger vehicles.
(Effective April 18, 1972)

Sec. 29-349-364. Display of warning placards

Transportation of quantities in excess of 50 pounds in other than passenger vehicles shall be in accordance with U.S. Department of Transportation requlations, except that warning placards shall be prominently displayed when more than 250 pounds are being transported.
(Effective April 18, 1972)

29-349-365. Shipping container storage

All smokeless propellants shall be stored in DOT approved shipping containers.
(Effective April 18, 1972)

Sec. 29-349-366. Residential storage

Smokeless propellants intended for personal use in quantities not to exceed 50 pounds may be stored in residences; quantities over 20 pounds but not to exceed 50 pounds shall be stored in a wooden box or cabinet having walls of at least 1 inch nominal thickness.
(Effective April 18, 1972)

29-349-367. Commercial establishment displays

Not more than 50 pounds of smokeless propellants, in containers of 1-pound maximum capacity, shall be displayed in commercial establishments. Commercial stocks of smokeless propellants over 20 pounds and not more than 100 pounds shall be stored in approved wooden boxes having walls of at least 1 inch nominal thickness. Not more than 50 pounds shall be permitted in any one box.
(Effective April 18, 1972)

Sec. 29-349-368. Commercial stock storage

Commercial stocks in quantities not to exceed 750 pounds shall be

any one cabinet.
(Effective April 18, 1972)

29-349-369. Storage in excess of 750 pounds to be in magazines.

Quantities in excess of 750 pounds shall be stored in magazines constructed and located as specified in Chapter IV.
(Effective April 18, 1972)

29-349-370. Small arms ammunition primers

Small arms ammunition primers shall not be transported or stored except in the original shipping container approved by the U S. Department of Transportation.
(Effective April 18, 1972)

29-349-371. Truck or rail transportation

Truck or rail transportation of small arms ammunition primers shall be in accordance with U.S. Department of Transportation regulations.
(Effective April 18, 1972)

29-349-372. Primers limited in passenger vehicles

Not more than 25,000 small arms ammunition primers shall be transported in a passenger vehicle.
(Effective April 18, 1972)

Sec. 29-349-373. Primer storage limited in residences

Not more than 10,000 small arms ammunition primers may be stored in residences.
(Effective April 18, 1972)

Sec. 29-349-374. Primer displays limited

Not more than 10,000 small arms ammunition primers may be displayed in commercial establishments.
(Effective April 18, 1972)

Sec. 29-349-375. Primers to be separated from other materials

Small arms ammunition primers shall be separated from flammable liquids, flammable solids (as classified by the U.S. Department of Transportation), and oxidizing materials by a fire-resistive

wall of one-hour rating or by a distance of 25 feet.
(Effective April 18, 1972)

29-349-376. Primer storage limitations

Not more than 75,000 small arms ammunition primers shall be stored in any one building, except as provided in Section 29-349-377; not more than 100,000 shall be stored in any one pile, and piles shall be at least 15 feet apart.
(Effective April 18, 1972)

29-349-377. Primer storage in magazines

Quantities of small arms ammunition primers in excess of 750,000 shall be stored in magazines in accordance with this Code.
(Effective April 18, 1972)

## CHAPTER XIII. FORBIDDEN EXPLOSIVES

29-349-378. Forbidden explosives list

Explosives forbidden or not acceptable for transportation by these regulations shall include, but are not limited to:

(a) Liquid nitroglycerin.
(b) Dynamite (except gelatin dynamite) containing over 60 percent of liquid explosive ingredient.
(c) Dynamite having an unsatisfactory absorbent or one that permits leakage of a liquid explosive ingredient under any conditions liable to exist during storage.
(d) Nitrocellulose in a dry and uncompressed condition in quantity greater than 10 pounds net weight in one package.
(e) Fulminate of mercury in a dry condition and fulminate of all other metals in any condition except as a component of manufactured articles not hereinafter forbidden.
(f) Explosive compositions that ignite spontaneously or undergo marked decomposition rendering the products of their use more hazardous when subjected for 48 consecutive hours or less to a temperature of 167 degrees F. (75 degrees C.)
(g) Explosives containing an ammonium salt and a chlorate.
(h) New explosives until approved by the U.S. Department of Transportation except that a permit may be granted for transportation and possession for laboratory examination of such explosives when under development by responsible research organizations.
(i) Explosives not packed or marked in accordance with the requirements of the U.S. Department of Transportation.
(j) Explosives condemned by the U.S. Department of Transportation.
(Effective April 18, 1972)